

Ministry of Heritage
and Culture

Serge Cleuziou & Maurizio Tosi

IN THE SHADOW OF THE ANCESTORS

The Prehistoric Foundations of the Early Arabian Civilization in Oman



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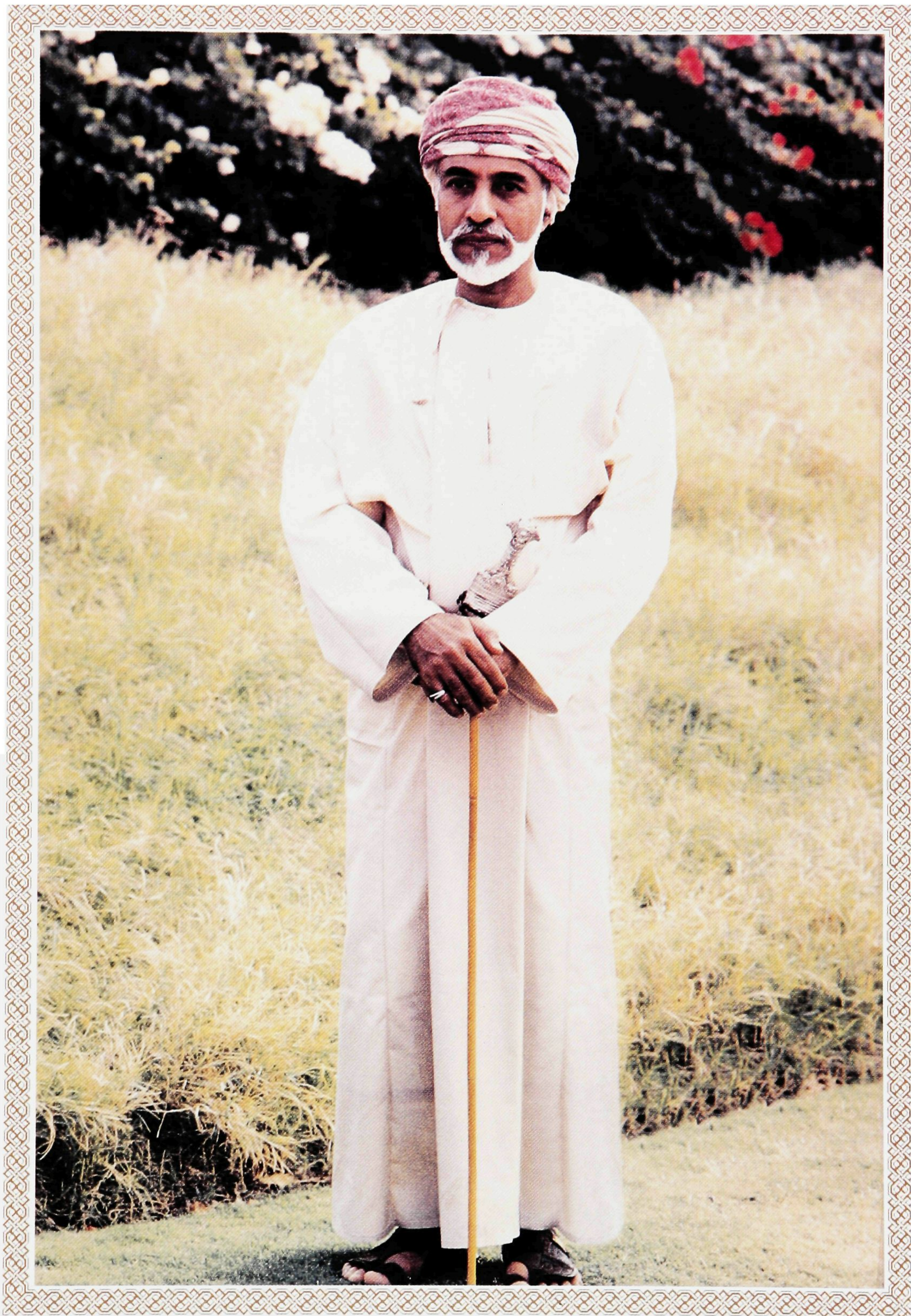
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His Majesty Sultan Qaboos Bin Said

This book is dedicated to every researcher and academic scholar whom by their effort and time committed to recover the Early Civilisation of Oman.

It is also dedicated to the Ra's Al-Jinz community of fishermen who collaborated in revealing the glory of their distant ancestors. And finally, to the people of Oman who belong to this glory.

ACKNOWLEDGEMENTS

This volume is the result of many years of work in Oman and the ideas and opinions expressed in this book are of course those of the authors themselves: we owe thanks to several people who have helped with this volume in one way or another. First of all we are very thankful to His Royal Highness Sayyid Haitham bin Tarik Al-Said, Minister of Heritage and Culture, who has disclosed for us the unique possibility to direct our scientific commitment towards a fuller enhancement of Oman's great historical contributions to Mankind. Thanks are due to His Excellency Eng. Sultan bin Hamdoon Al-Harthy, the Undersecretary for Heritage in the Ministry of Heritage and Culture who sharing with us the everyday problems in rediscovering the rich tapestry of Oman heritage. A cornerstone contribution in the architecture of our recent work in Oman is represented by Mr. Hassan Mohammed Ali Al-Lawathi, Director General for Archaeology and Museums.
When we started working in Oman, many years ago now, the Minister of Heritage and Culture was His Royal Highness Sayyid Faisal bin Ali Al-Said, a man of great generosity whose open attitude encouraged our work and gained a perpetual memory of great deference.

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Since the very beginning our work in Oman has been sponsored and assisted by the Department of Antiquities of the Ministry of Heritage and Culture: doors were wide open as nowhere else in the world of our wide experience, including our home countries. To say "there was collaboration with the Authorities" would be a rather diminutive statement for the welcome, sympathy and assistance we always got, year after year, project after project. Our ideas once turned into proposals were met always with attention and support. In fact this book is the result of a great mutual respect that over the years has turned into a solid friendship with all the people working in the Department. First of all we would like to thank the early Directors of Antiquities, Dr. Paolo Costa (1976-1979) and in particular Dr. Ali Ahmed Bakhit Al-Shanfari (1979-2004) who was for both of us a true companion for a quarter of a century. Further more our gratitude goes to the present Director of Excavations and Archaeological Research, Ms Byubwa Ali Al-Sabri, who has been the energy and will behind this book and other projects that are changing the face of Oman's archaeology. Aside we own gratitude and respect to the other lady of the Department, Ms Rahma Qassim Al-Farsi, Head of the Archaeological Studies Section, who greatly participated in the editing work and whose gentleness has most contributed to the sympathetic atmosphere we encounter in the Ministry. Without them this book never would have been realized.

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Ra's Al-Jinz, our main "home" in Oman for so many years, is not only an extraordinary archaeological site but also a beautiful and highly significant natural reserve, into which the collaboration between archaeologists, conservationists and rangers was always friendly and efficiently managed by Dr. Ali Al-Kiyumi, Director of Natural Reserves and a renown expert of the turtles, that for long time preceded humans in the appreciation of this easternmost corner of Arabia.

Many people – too many to mention – helped us to complete this volume; only a few can be explicitly acknowledged here. Eng. Mariangelo Lampertico ought to be mentioned first since he was the very first person who suggested and promoted this book that originally had to be published by a private company. In particular we are indebted with many among the friends and colleagues who have been working with us in

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We sincerely thank Helene David for her very able assistance with the beautiful maps and drawing prepared for this volume. For specific help in gathering together the strands of scattered data we would like to thank Alessandra Lazzari and Victoria de Casteja. The imaginative vignettes that reproduce the first hunters of Arabia are the fine workmanship of Giorgio Albertini, widely recognized master artist in portrayals of past life.

However we should stress that any faults or errors remains entirely our own responsibility. Such long term work could hardly be carried out without the help of many people all over the country, and here again it would be impossible to name all of them. The very beginnings of the field project at Ra's Al-Jinz, at that time a very remote part of the country, would have been almost impossible without the encompassing help and deep friendship of Maj. William Foxton. Along with him came a sequel of Omani and British officers of the Sultan Armed Forces: their skillful assistance and patience are acknowledged with gratitude. Particular thanks for help are also due to Mr. Jean-Paul Breton of BRGM Oman.

At the end we must acknowledge the skillful forbearance of our editor Professor Adrian Roscoe for the very high standards of his revision work. The English language is a misty countryside of towering cliffs and hidden pathways that we would have never crossed without his guidance. Well might we write with the same words of Dante's incipit of "The Divine Comedy", still the best representation for the condition of all lost travelers, real and virtual alike:

...mi ritrovai per una selva oscura ché la diritta via era smarrita. Ahi quanto a dir qual era è cosa dura esta selva selvaggia e aspra e forte che nel pensier rinova la paura!

...I found myself within a forest dark, for the straightforward pathway had been lost. Ah me! How hard a thing it is to say what was this forest savage, rough, and stern, which in the very thought renews the fear.

Serge Cleuziou & Maurizio Tosi
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1 June 2007

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A Diversity of Landscape and Opportunities

Chapter 1
A Diversity of Landscapes and Opportunities

Historians, and archaeologists among them, love to reduce complex issues to lapidary statements. They hope to impress others by conveying an immediate message in a few words. "Egypt is the child of the Nile" is a good example. Since the Egyptian priest Manethon wrote it 2300 years ago to explain his country to the new Greek rulers it has been quoted endlessly, disguising the fact that Egypt as a country was made not by river floods but by its own people. It was a land of swamps where hippos and crocodiles flourished. To turn it into a land of plenty, one of the richest countries in history, its inhabitants laboured intensively over millennia. So we could begin this book by saying that Oman is the child of a marriage between mountains and sea, thus ignoring the fact that behind its early civilisations lay Herculean work by men and women who, generation after generation, and in brief life spans, transformed a desert country of scarce and erratic resources into a model of human progress. This transformation is the story this book will narrate, piecing it together from the scattered clues of archaeological remains.

The modern concept of "civilisation" was developed in the eighteenth century during the Age of Enlightenment to explain the entirety of values, institutions and traditional achievements shared by the people of a given region in a given period of time. The word comes from the Latin *civitas* (synonymous with the Greek *poleis*), which the ancient Romans used to describe the city as a complex of political laws, institutions and social relations that generated a superior form of life. Until fairly recently historians and popular opinion used to identify civilisations with urban societies, thus considering any social and political system other than cities as primitive or, as the Greeks would have said, barbarian. In Aristotle's vision of the world, cities were the flywheel that created wealth and progress from social complexity. It is no coincidence that for the ancient Greeks the greatest of all heroes were city founders.

Concurrent advances in anthropology, sociology and archaeology during the twentieth century have radically questioned this close association between urbanism and civilisation as a form of superior social life. Cities became increasingly viewed as an effect and not a cause of the new order: the product of efficient political structures able to integrate in a single space different groups in spite of their diversity of traditions and cultures. "States", the highest form of political structure, were then regarded as the key factor in the establishment of the earliest civilisations. From an evolutionary perspective, this view made better sense. The expansion of social and economic complexity would have required higher levels of political integration and more sophisticated forms of government, abandoning kinship and lineage relationships as the basis for the legitimisation of power. Although globally the extended family remained the primary aggregation, authority over increasingly larger territories and populations required specialised institutions for control and management: kingship took the place of kinship.

Once the focus of attention was shifted to the emergence of states, it became evident that cities were not the only possible outcome. Other forms of "civilisation", equally based on complexity of social relations and political structures, developed across the Old World. We may mention the steppe nomads of Eurasia, the tribal federations of Arabia, or the peer alliances of elders and warriors that ruled over most of continental Europe before the Roman conquest. The equation between civilisation and city had become too restrictive to cope with the diversity of political forms that expressed social complexity. It has now been substituted by an equation between civilisation and state, indicating any complex form of institutionalised government that allows the coexistence of different groups within a single political system. What we currently call "civilisations" are systems determined by diversity, in their formative process as well as in their highest achievements.

It is true that there are neither pyramids, temples, nor written clay tablets to illustrate the early civilisations of Oman in a way that speaks directly to the people. But science and scholarly perseverance have made it possible to disclose past greatness from hidden clues. The archaeology of Oman is a very young discipline, only forty years old and not even embracing two generations of scholars. Also, the country's historical and geographical conditions are unique in that very little use can be made of the experience gathered in neighbouring countries like Iran, India or the Mesopotamian heartland of civilisation split between Iraq and Levant. As for the rest of Arabia, the evolution of social complexity in Oman was untypical. While countries along the Nile, the Euphrates and the Indus established their civilisations on hierarchies, administration and royalty, Arabians took another path. The common foundations of traditional Arabian society were built on the family. Lineage, kinship, group feelings and belief in a common ancestry, whether real or fictitious, tied the bonds between individuals.

This diversity did not prevent Arabia from developing her own civilisation, in spite of open and continuous exchanges with the other countries of the Middle East. To appreciate her particular contribution we need to begin by disputing any reductive definition of civilisation. The words of Ibn Khaldun explain very persuasively that the quality of a civilisation is measured by its level of social cohesion: "The existence and persistence of the human species can materialise only through the cooperation of all men in behalf of what is good for them. It has been established that a single human being could not fully exist by himself [...] Consequently, social organisation is necessary to the human species [...] God's desire to settle the world with human beings and to leave them as His representatives on earth would not materialise. This is the meaning of civilisation" (al-Muqaddimah, chapter 1, 1).

A civilisation is not a heap of stones or a gallery filled with wonderful paintings and statues, as tourists in Egypt or Italy are made to believe. "Civilisation" is the name we give to the most complex systems created by humans to enrich and rediscover themselves. Its material heritage may have disappeared without trace for future archaeologists. Not one but many examples of Atlantis have sunk in the ocean of oblivion. As students of the past, our goal is to rediscover these lost expressions of human achievement from the most dispersed and obscure clues.

Though it may sound romantic, archaeology is a discipline that works to recover from sherds and ruins the memory of men and women since long dead. Nor is this comparison accidental, for archaeology as a discipline came into being in Europe exactly during the age of Romanticism, between the end of the Eighteenth and the beginning of the Nineteenth centuries. As the French Revolution and the turmoil created across Europe and beyond by the armies of Napoleon ended the power of kings and aristocrats, the life and expectations of individuals became the centre of political and philosophical thought. The new nations and their elites turned to a different vision of the past, outside the bonds of religion and dynastic order, looking for new sources of legitimisation. People and not kings would make the law. Since poets know how to state things memorably, there is no better witness to this new vision than the verses of one of the most remarkable voices of that time, Percy Bysshe Shelley (1792-1822) in his "Ozymandias":

I met a traveller from an antique land,
Who said: Two vast and trunkless legs of stone
Stand in the desert. Near them, on the sand,
Half sunk, a shattered visage lies, whose frown
And wrinkled lip and sneer of cold command,
Tell that its sculptor well those passions read,
Which yet survive, stamped on these lifeless things,
The hand that mocked them and the heart that fed.
And on the pedestal these words appear:
"My name is Ozymandias, King of Kings:
Look on my works, ye Mighty and despair!"
Nothing besides remains. Round the decay
Of that colossal wreck, boundless and bare
The lone and level sands stretch far away.

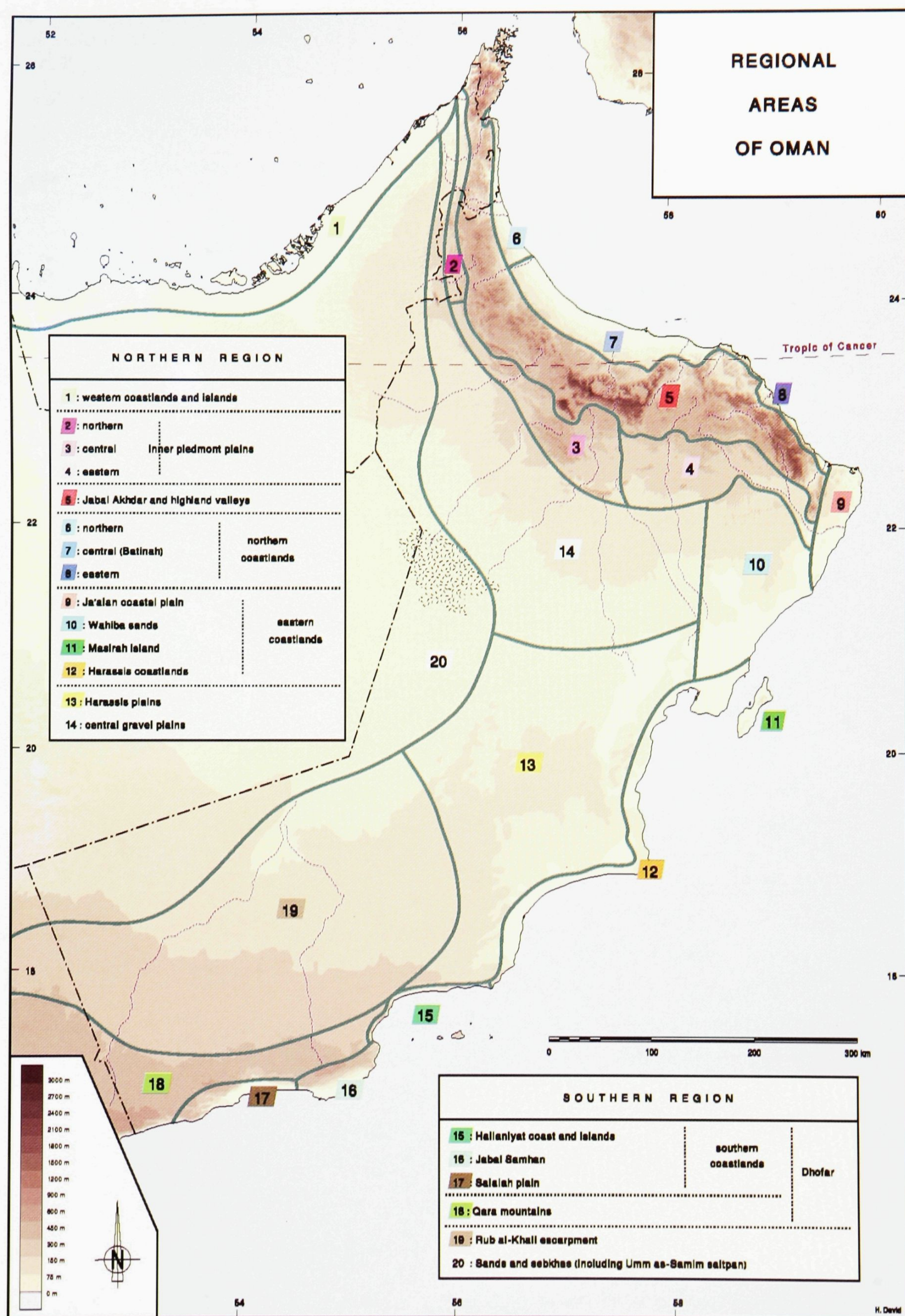


Figure 1:
Main regional divisions at Oman according to the ecological zones and the distribution of natural resources, both determinant for the economical bases for human groups in Prehistoric times. Coasts, mountains, deserts and plains determine the different compartments of the early human populations (drawing by Hélène David).

An Island between Desert and Sea

To trace the earliest history of Oman and attempt to explain its unique path to civilisation, we need to begin with its geography. This is not because landscapes rule people. Since fire was brought under control some half a million years ago, humans have been perfectly equipped to master their environment and to transform plants and animals into resources. They have done this in every latitude, but the form of control has changed accordingly. As a consequence, the culture, and eventually the civilisations, they produced over time were different. For many, this diversity is the most remarkable character of mankind and to retain it is essential for our future. If understanding the past means explaining the essence of our diversity, then the study of the past becomes critically essential for our future.



Figure 2:
Holy and Precious headwaters: a natural Pool from a fresh water spring in the Omani mountains, here at Wadi Al-Arbayn (photo Joint Hadd Project)

As stated in our opening paragraph, mountains and ocean have combined to direct the history of Oman. A literal sea marks its northern and eastern rim while a sea of sand encloses the country to the south. One may describe Oman as an "island within an island", because the mountains that divide the sea

from the desert at the edge of the ocean, facing India, merge within another "island", the *Jazirat Al-Arab*, as it was called by its own inhabitants (fig. 1). The Arabian peninsula itself is enclosed on three sides by the sea and on the fourth by rivers and lakes: the Euphrates, the Jordan, and the Dead Sea. It resembles a Chinese box arrangement with one world locked inside another. The six hundred kilometres long Hajjar mountains wind their way across the whole of Oman, from the Musandam headlands to the Ja'alan, with one face looking at the Indian Ocean and another at the Great Arabian Desert. There is nowhere in Oman where you cannot see mountains. They have shaped the country's identity and been the source of most of its wealth. Their altitude reaches about 3000 metres at Jabal Shams in the Jabal Akhdar massif and they form a continuous wall thirty to fifty kilometres wide, broken by a few river courses flowing along tectonic fault lines. There are four main passages across the mountains: to the north the Dhayd-Fujairah corridor and the Wadi Al-Jizzi, between Buraimi and Sohar; in the centre the Samail Gap, the widest highway, connecting Nizwa to the eastern Batinah and the Capital Area; to the east the Wadi Fulayj corridor linking Wadi Al-Batha to the port of Sur. Access to the sea from the interior is also possible without passing through the mountains, by moving along the inner piedmont plains to the north at Ra's Al-Khaimah or crossing short desert distances to Dubai and Abu Dhabi; while to the south the Wadi al-Batha corridor ends in a series of lagoons stretching between as-Suwayh and Ra's Al-Jibsh alongside the Sharqiyah Sands.

Oman is both compact and open. Although the mountains are ubiquitous, no part of the country is denied access to the sea. This means that since prehistoric times no group has been really separated from either of the two main sources of wealth, the sea and the mountains. For this reason, it is meaningless to say that Oman has arisen from two distinctive countries, with two parallel histories. On the contrary, the early unity of these two geographical elements has been of the essence of its architecture. Indeed archaeological remains indicate that to a large extent the integration between coast and interior may be traced back at least 6500 years.



Figure 3:
No man's land: sand dunes in the desert, towering over the road to Salalah. But the alliance of humans and camels overcame the empty broad expanses, turning Arabia into the only desert land on earth where humans could live and prosper (photo Joint Hadd Project).

Crossed by the Tropic of Cancer, the Omani mountains are situated between the latitudes 22° and 24°30' north. The whole country is included in the subtropical zone of arid climates. With the exception of the highest parts of Jabal Akhdar, temperatures remain high all the year round, while average rainfall remains very low, ranging from an annual 171 mm at Nizwa to 36 mm at Sohar, well below the 250 mm conventionally accepted as the boundary of aridity. Although far too scarce for the dry farming of any crop, these rains have been sufficient to create the conditions necessary for a very successful agriculture by feeding a widespread ring of aquifers and springs all around the mountains. The geological structure of permeable limestone over impermeable metamorphic rocks is such that water is rapidly stored underground for long periods, feeding a large number of upstream ponds (fig. 2). These abundant water supplies have acted as natural storage facilities and make Oman a country self-sufficient within the Arabian desert. Of course, to channel these water reserves into the necessary irrigation systems for growing crops and trees has required much ingenuity, skills and hard labour in a millennia-long investment. The *falaj* system, as we see it nowadays, is the final result of a long history, but to a large extent it was established some 5000 years ago. Techniques for capturing, transporting and storing water were already developed around 3000 BC, when the first oases came into being along the Omani mountains.

The Water Factor

Under natural conditions not all rain will end up filling ponds and underground aquifers. On the contrary, most water flows along mountain slopes cutting crevasses and gorges to feed an intricate latticework of streams, rarely reaching the sea. Most of it is dispersed in vast imbricated deltas along the border between desert and mountains, building alluvial plains and evaporating. Rocks are broken by the water, limestones before the harder metamorphics, but over time they end up along the riverbeds, crushed into boulders, gravel and silt. Many different plant communities crowd the banks and beds of the winding streams. If one looks from the air these arid mountains appear grooved by stripes of green, marking the passage of water. When water is not drained off for farming, bushes may crowd into thickets, growing downstream into riparian forests, known across the Middle East by the Persian word *jangal*. Lower still, the water flows into the plains, winds its way across earlier sediments, and divides into smaller and smaller channels to form alluvial fans of fertile soil. Finally, sand or sea will claim what water is left. In the north, watercourses merge with the sea, where freshwater meets the marine



Figure 4:
Man-made environment created by an artificially concentrated biomass: Bahla, a lowland oasis, and an historic town at the heart of the Oman interior, developed after the Bronze Age along the water-rich piedmont plains. As elsewhere in all arid lands worldwide continuity of wealth and settlement are directly related to a constant water supply. (photo Joint Hadd Project)

Figure 5:
Ecological zones across Oman's tectonic crest and the wild animal populations that lived in them. This schematic section groups the main ecosystems of Oman, from pelagic waters of ocean depth to the highlands of Jebel Akhdar and beyond to the salt marshes in the Rub' Al-Khali. It indicates the main sources of food that were available to the prehistoric population segments. Specialization, seasonal scheduling and patterns of alliance fostered regular exchanges expanding the subsistence base of each group. As part of subsistence strategies, trade became embedded in the Arabian society at the dawn of history (drawing by Hélène David).

environment forming creeks and lagoons, the richest biotopes in the country. In the south, the desert swallows the water coming from the mountains in a mosaic of different situations, each endowed with different plant communities, becoming the original home for herds of diverse animal species adapted to the most arid conditions and the grazing land of the Bedouins, the truest of the Arabs in Ibn Khaldun's view: "The desert is a place of hardship and starvation, but to them it has become familiar and accustomed. Generations of Bedouins grew up in the desert … their defence and protection are successful … [because] they are a closely knit group of common descent … Clearly the Bedouins are closer to being good than sedentary people" (Al-*Muqaddimah*, chapter 2, 4-7). (fig. 3)

Where the water ultimately disappears the realm of sand begins (fig. 4). The ancient sediments are blanketed by moving dunes at times a hundred metres high. White patches of silt broken by the wind indicate the remains of lakes as final witness of past climates, when Arabia was already arid but still coloured by hundreds of small and large water bodies surviving among the dunes or along the dry escarpments. Some lake sediments are still covered by vast deposits of salt, another remnant of the dead waters, like the Umm as-Samîn. The dry courses of the largest riverbeds of the Oman interior, like Wadi Andam, are still converging into these vast depressions, making us dream of green valleys and blue lakes that probably were never there for more than a few days. There is no lost paradise to be found



Figure 6: The dense clustering of houses and cultivation in a village of Wadi Bani Awf, closely shaped by the aquifers as a glove around a high limestone outcrop (photo Joint Hadd Project).

among the wastelands of the Empty Quarter, but a much more interesting history of endurance, bonding animals and humans alike in their capacity to survive through adaptation to the climate's vagaries and harshness. Radiocarbon dating has confirmed that these water bodies were mostly active sixty to fifty thousand years ago, surrounded by lush tropical vegetation, as proved also by the bones of hippos and buffaloes. They dried up several times and the last lakes in the Rub' Al-Khali date from between the tenth and the fifth millennium BC.

Human relationships with these erratic environments between water and desert are recorded down the millennia by thousands of flint scatters and the remains of campsites that pinpoint diverse situations, from the terraces at the edge of present oases to the remotest desert sand dunes. These scatters indicate that, from very early times, small groups of hunter-gatherers would have taken advantage of all water sources and the many different plants and animals that lived off them, between the vast *jangals* and the smallest thickets around water holes. It is evident that the history of Oman begins long before agriculture was practised towards the end of the fourth millennium BC.

The richest biotopes were related to the most permanent water sources: the aquifers within and around the mountains and coastal lagoons. Here settlements might have been possible long before agriculture, allowing human groups to live in the same place with enough food for the whole year (fig. 6). But springs and streams are not the only water available. Dew is another source. Suspended in the air with billions of tiny drops, it provides a significantly large amount of water, spreading also far away from the river beds. Many plants and animals are adapted to living on water taken directly from the humidity of the air. Gazelles and other animals feed almost exclusively on this and often can go weeks without drinking. Provided that conditions are right for retaining this suspended moisture for a few hours during the early part of the day, before wind and heat disperse it, even dates and other fruits can be made to grow in the sands of the most scorched desert. From Morocco to Arabia, the Bedu know this very well and with a beautiful expression call it "the other Wadi". Because dew was abundant and resistant in the narrow valleys across the Omani mountains, human life was not limited to the water corridors but could spread across the hills and piedmonts with a wealth of food available.

Farming is suitable where the sediments are the finest and cultivation has developed mostly on these alluvial fans. But, as everywhere in arid lands glob-

ally, the easiest water and the most fertile land are at quite a distance from each other. Intensive cultivation required that they be brought together and, since water is easier to move than soil, the history of agriculture in those lands has been mostly paced by that of irrigation (fig. 7). Gravity transports water downstream and the trick is to direct this natural flow with minimal costs in terms of effort and dispersal. After many centuries of labour, by cutting small fields along the upper terraces and removing the stones embedded in the ground, farmland was opened in the upper sections of the rivers, closer to springs and ponds of natural storage. Oasis agriculture has been a continuous process and over the millennia labour has turned Oman into a garden, an Eden of fruits and crops wherein humans could not only live but extend their wealth and knowledge through travel and trade (fig. 8). The taming of the desert and the ocean has represented two sides of the same coin minted by Omani endurance and ingenuity.

Mountains as a Source of Biodiversity

Mountains are the essence of Oman and from the earliest times the guideline to its history. Few regions in the world have been so directly conditioned by plate tectonics. If we can use an imaginary vision from our European archetypes, the Omani mountains look like an immense sleeping dragon lying with head and tail on the ground and its huge back rising in the centre. The head is in Musandam, the tail curls with Wadi Al-Batha around the Wahhiba sands. Or the other way around: it makes no difference. The blood flowing from its vast belly gives life to the fertile lands around it: Nizwa, Bahla, Ibra, Rostaq, Nakhel and so on. The Samail gap cuts across it as one deep slot. Throughout Eurasia, from China to the misty Germanic dreams of hidden treasure and glorious fights, the dragon is a symbol of heavenly force and eternal life. It might not have had the same meaning for Sindbad and oriental visions of sun and light, but it still feels appropriate to mention it for Europeans who, when crossing those mountains as occasional visitors, may be deceived by their barren appearance and not realise they were the main source of life for Omani civilisation.

Quite differently from the plateaux of Dhofar and Yemen to the south, or the Makran chains to the north, the Omani mountains are a single, compact, continuous and narrow ridge, at most not more than sixty kilometres wide. An ideal cross-section running NNE-SSW from Birka on the Batinah coast south to the Umm as-Samin depression, for over three hundred kilometres, clearly shows the wrinkling of lofty Jabal Akhdar that plunges steeply on both sides down to the sea and to the great interior desert. In only sixty or so kilometres, the ground rises from zero to three thousand metres. At a distance of only ninety-five kilometres from the coast, we drop to five hundred metres near the water-fed oases of Bahla and Nizwa. Further south, the slope



Figure 7:
Taming the slope with pockets of soil: terrace cultivation at Bilad Sayt, in the highlands of Jebel Akhdar. Here at Wadi Bani Awf dew complements the underground waters: the "other wadi" (photo Joint Hadd Project)



Figure 8: The work of many generations and the symbol of a lasting alliance at the edge of the Great Arabian Desert: the vast oasis cultivations of Sinaw (photo Joint Hadd Project).

becomes more gentle and regular for some two hundred kilometres, reaching the salty depressions at the edge of the Rub' Al-Khali. Over the first hundred kilometres of the cross-section Jabal Akhdar represents a true wall between coast and interior.

From the flat surface of the mountain tops to the centre of the desert depressions or, in the other direction, across the seashore to the edge of the continental shelf and the pelagic sea, the environment of Oman is a true mosaic of intersecting ecosystems. This diversification is critical for understanding its prehistory and for explaining the special pathways taken by its civilisation since earliest times. There are many factors involved, but the mountains are the most determinant. Here the environment varies, both vertically along the slopes, as a function of height above sea level, and horizontally, as a function of distance from water courses. Apart from the hillside mosaic, diversity also results from climatic conditions, some regional, like the tight interplay between desert depressions and ocean waters, others global, like those determined by the fluctuations of the monsoon fronts. Moving among these compartments, early human groups of hunters and foragers would have been confronted with a rich biomass, provided they were able to negotiate its delicate balances by seasonally shifting from one resource to another. In such extreme environmental variability, plants and animals are distributed in small patches of land densely packed in their ecological niches. The relationships among the different species within each of these niches become extremely close, each species relying on the others for life and reproduction. An ecological niche is essentially a community of interdependent relations. For this reason, modern ecology has established that it is meaningless to define adaptation and evolution by singling out a particular pathway for each species, because their interdependence is such that it can be better conceived as a co-evolution of their associations. Humans behave no differently among themselves and in relation to their homelands. Their cultural evolution has to be understood within a web of interwoven connections.

The human communities which depend on these resources are compelled to follow a similar logic and to diversify their exploitation in complementary sectors. Not surprisingly, in traditional Oman, architecture, systems of production, and lifestyle also vary in each area according to principles similar to those adopted by the flora and fauna, although they have not produced segregation, thanks to the development of social mechanisms of integration.

Before they developed the means to transform their environment, human communities were also complementary or symbiotic. The early hunters and gatherers depended for their subsistence on a few main species of animals or plants, and all aspects of life had to be scheduled according to the vagaries of their food sources. While we have to eat at least once daily, no food source at a given location will remain satisfactory for the whole year. Both on land and sea, plants and animals have their cycles. They move or they retreat, they die or become very lean.

In regions of high biological diversity like Oman, where many ecological niches are packed into small areas, the main strategy of prehistoric foragers centred on control of "ecotones". Once occupying a safe position overlooking at a short distance a number of different environmental zones, a human group could control an intersection point, an "ecotone", from where it could direct the exploitation of a broad spectrum of animals and plants within a small territory stretching just a few kilometres around their campsites. Since the biological cycles of the plants and animals involved were different, exploitation could be organised in a single long-term schedule over several seasons without moving from the same place (fig. 5). Not surprisingly, these campsites, often identified only by a few scattered flints, were almost permanently occupied, and, by growing annually, they laid the foundations for the future settlements of Oman's Early Bronze Age civilisation.

The Ocean.

Surrounding the land on three sides with a blue belt no less ubiquitous and diversified than the mountains, the sea spells out for us the other half of Oman's prehistory. Every Omani knows from childhood that the sea is a central part of his heritage. Ocean navigation has been immemorially a source of wealth and conquest and has helped to shape the particular character of the people and their civilisation. The origins of navigation are deeply rooted in prehistoric times, beginning with the first exploitation of the deep and shallow waters along the coast. There are three main types of coastal environment in Eastern Arabia: sandy beaches, rocky cliffs and lagoons (fig. 9, 10). Each is home to very different populations of plants and animals. If we are impressed by the biodiversity of the mountain slopes and Wadi beds, far more astonishing is the diversity that crowds into a few hundreds square metres across any segment of the seashores. This is not only related to coastal morphology but combines with the kind of sea and land being separated.

These tropical waters are also home to a large biomass, making it one of the world's richest fishing grounds, in sharp contrast to the barren emptiness of the desert lands of the interior. Fish, turtles, molluscs, crustaceans and marine mammals crowd the steep edges of the continental shelves, organised in many interwoven food chains that all stem from vast floating banks of plankton. This abundance of fish has been feeding mythical tales even more than peo-



Figure 9:
Muddy mangrove swamps formed by the clustering of Avicennia marina along the brackish waters of a khowr, like this one at Quriyat, are biomass concentrations of the highest productivity. Hunter-gatherers across the entire Indo-Pacific region had here a unique environment with vast and diversified plant and animal resources available all year round. (photo Joint Hadd Project)

ple. Pedro Pexeira, one of the first Europeans to report on Oman at the beginning of the sixteenth century, has left us one of the most vivid descriptions of this fish bonanza: "It is so easy to catch fish that a hungry cat can come to the sea, put in its tail, and when fish come to bite it, swish them ashore". Whether this fishing cat is real or legendary, the fact remains that food was always available from the sea for anybody with a minimum effort. This great productivity derives from upwelling, a seasonal phenomenon that occurs during summer, between May and October, in connection with the southwest monsoon, when the persistent action of the wind removes surface waters from the coast. It is a blessing that, in the entire western Indian Ocean, occurs only on the coast of Oman between Ra's Al-Hadd and Dhofar and along the Somali coast south of Cape Gardafui. The rise of colder deep sea water carries to the surface nitrates and phosphates from the ocean floor. These are the nutrients of phytoplankton, the base of all marine food chains that, moving in waves along the coast of Oman, create conditions of life for zooplankton and hence for the massive occupation of the area by fish, birds and marine mammals. One might suppose that humans first came to the ocean because of this unique food resource and then learned to navigate the seas. In reality only the first part of this sentence is true. Upwelling made available fish and other species in great quantities just off the coast and people settled to exploit them; and amidst such abundance there was no need to develop long-range navigation to catch fish. In other areas of the world where upwelling is even more permanent, and on a much greater scale, as in California, Peru or Western Australia, although one finds thousands of shell middens with fish remains created by prehistoric people over millennia, there was no development of ocean navigation to parallel Oman's. Later, we will discuss the special conditions that made the Omanis of five thousand years ago the earliest navigators and traders across the ocean: none originated from the quest for food.

It took a long time before humans ventured even a few metres into the sea to catch any of the many species available there for food. For thousands of years they ate fish and other animals stranded on land by the waves. Shoreline shell beds were exploited for food in Eritrea more than a hundred thousand years ago. But to build up a culture and economy that depended on the sea took many more millennia. The sea is an alien world, as deadly as outer space, and many men and women must have died just a few metres from the shore. And yet fear



Figure 10: The coastal lagoon of as-Suwayh in the Ja'alan, during the rainy season. The photograph was taken from SWY-2, a 4th millennium BC site resting on a sand bar next to the seashore. On the sand dune that climbs the rocky hill in the background, just a mile across, there is another Middle Holocene site, SWY-5, exploiting instead the inner side of the lagoon. No pocket of potential resources was forgotten (photo Joint Hadd Project)

was overcome, maybe long before humans got used to living on fish. It is not known when the first floating raft was put together to cross the oceans. We can only use the indirect evidence of human migration to islands. Australia was populated already during the Pleistocene, some 60,000 years ago, and the forefathers of the Aborigine had to come from Indonesia across no less than a hundred miles of open sea. The earliest persuasive archaeological evidence for intensive marine exploitation by coastal foragers has been dated to between 12,000 and 8,000 years ago in Denmark and in different areas of the Indo-Pacific ocean, from Japan to Eastern Arabia.

The part of the Indian Ocean bordering Eastern Arabia on both sides of the Oman peninsula is a rich and complex ecosystem of coral reefs, mangrove coastlines and deeper water communities. The coast is divided between areas of relative simplicity and marked diversification, mainly where lagoons are formed between beaches and rock cliffs. Coastal conditions may change quite rapidly as an effect of any minimal variation of land and sea and thus the extreme biological diversity in space combines with that over time. Two main factors of change independent of each other are tectonics and sea level fluctuations.

While tectonics, the movement of the earth's crust, built the original morphology of the Omani landmass, the coast has been mainly shaped by sediment from the mountains and the action of the sea. Rainfall cuts narrow corridors to the seashore across the rock shelf eventually forming gravel fans or lagoons of brackish water. Beaches alternate with rocks, and both are interspersed by creeks and lagoons. Changes are mainly determined by expansion and contraction of the polar ice caps. For the Late Pleistocene, over the past 130,000 years, variations in the Indian Ocean have been recorded up to 120 metres below the present sea level, and 40 metres above it. This means that the earliest shell middens we have so far identified in Oman, dating from about 7500 years ago, might not be the earliest sites related to marine exploitation: those are probably under the sea. Around this time, the geomorphologists reckon that the sea in this part of the Indian Ocean reached for the first time its present levels, rising from a depth of 120 metres over a period of some 10,000 years. During this time, the Gulf, whose maximum depths are around 80 metres along the Iranian coast between Qatar and Musandam, was a dry plain cut by watercourses, almost a continuation of the Mesopotamian lowlands - a land with plenty of game for hunters.

The sea has buried under water and sediment the sites of the earliest fishermen of Oman as much as the wind has blown away or buried under sand the sites of the earliest hunters in the interior. The full history will be written only when archaeologists are able to recover remains from under the sea. The successful efforts of Danish archaeologists who, after years of exploration, have been able to discover the fully preserved settlements of Mesolithic fishermen in the straits between the North Sea and the Baltic, under 10-12 metres of water, tell us that such a costly project will bring rich returns. In the meantime, much as our Scandinavian colleagues have done during a century of intensive research, we need first to develop a better understanding of the sites and cultures we have on the Omani coast.

Since 5000 BC, overall sea level fluctuations have been a matter of a few metres; but in the diversified coastal morphology of Oman, even minimal variations can radically transform the landscape and natural habitat. Lagoons can form or dry up in a few years, affecting the life and economy of a single generation: within his own lifetime, a fisherman may have witnessed his home flooded by the sea or reduced to a barren sebkha. For these reasons, shell middens and other archaeological sites originally built on the shoreline are the best indicators of past lagoons. Their study, with the support of geologists and other scientists, will inform us in great detail about the natural history of the sea and coastlands of Oman.

This book explores the work of hundreds of generations of Omani men and women in dealing with these changing conditions and in building up a civilisation of their own that set the path for succeeding historical periods. ❑

Chapter 2

The Search for Oman's Earliest Humans

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Oman's earliest archaeological remains are surface spreads of stone tools such as cleavers, pounders and scrapers cut from pebbles and heavily worn by millennia of exposure. They lie among their manufacturing waste flakes embedded in the vast deflation pavements that cover the top of Pleistocene terraces, emanating from the hill sides, at the edge of deserts and along the mountain escarpments, well above the flood plains of present watercourses. These spreads have been observed sporadically throughout the country, from the Qara Mountains of Dhofar to the Harassis, and all along the Al-Hajar ridge in the north, from the tip of Musandam to Wadi Fulayj, behind Sur. Unfortunately, below the coating of pebbles there are no associated deposits to allow any reconstruction of the original campsites or to establish their chronological and cultural context. We can only say that the tools belonged to the foragers and hunters who lived throughout Eastern Arabia during the Palaeolithic; but dating remains very uncertain. We know very little about these people, and cannot learn much from such eroded sites mostly made by the loose debris of occasional workshops.

Apart from these surface sites throughout the mountains and deserts of Oman there are, as far as is known, no caves, no shelters under cliffs, no conglomerated deposits to preserve stratified deposits and direct our future exploration work. With experience gathered in other desert countries of the Old World, archaeologists are very reluctant to invest their resources in the painstaking collection and classification of these stone carpets, because the information to be recovered will not repay their efforts.

A first indication of an Early Palaeolithic site in Oman was found in 1998 by an American-Italian team of palaeontologists headed by L. Bondioli and R. Macchiarelli at Sur on a terrace 130 m. (fig. 11) asl overlooking the lagoons from the mouth of Wadi Fulayj. The stone pavement on the top contained several clusters of highly varnished tools and their manufacturing waste. By comparing these



Figure 11:
Possible Early or Early-Middle Pleistocene tools found in the vicinity of Sur (photo Joint Hadd Project / Roberto Macchiarelli).



Figure 12:
Two bifacial handaxes collected on surface sites near Shawbwa (Yemen). Although some prehistorians would suggest to date them from the Lower Palaeolithic according to their shape and flaking technique, their date cannot be ascertained due to lack of geological context and the fact that such tools continued to be made for a much longer period of time (photo Marie-Louise Inizan).

tools with those from better known regions in the Middle East, we can broadly refer them to the Middle Pleistocene, the phase of the Quaternary between 780,000 and 130,000 thousand years ago (fig. 12).

This is the period that saw the steady emergence of our own species, *Homo sapiens*, and humans establishing hegemony over all other species with the control of fire and the increasingly complex social organisation of their bands. There is very little we can add about the earliest cultures of Oman beyond the fact that small bands of prehistoric hunters lived on the plains and the mountain escarpments for approximately half a million years. It is quite a grim-looking start but there is no reason to believe this is the last word to be written on Oman's Palaeolithic period. On the contrary, the future might produce some big surprises. For this reason it is appropriate to provide at this *time* at least some food for thought.

Eastern and Southern Arabia, comprising the whole of Yemen and Oman, can be considered a direct extension of East Africa and the Great Rift Valley, the very cradle of mankind. Here human remains and related artefacts are connected to the formation process of *Homo ergaster/erectus*, the likely direct ancestor of modern man (fig. 13).

The latest calculations for body size reconstructed from bone remains from around 1.-1.8 million years ago (My) give values close to over 70 kg of average weight. Stature was quite tall, with some values close to 180 cm. What is most important is that at 1.6 My the body proportions were already close to the present Nubian type. The earliest evidence dates back to the terminal Pliocene, around 2.5 million My. Eastern Arabia would have been then a major corridor on the migration route *H. erectus* took out of Africa to populate Southern and Central Asia, where some of his remains have been dated back to 1.7-1.8 My. The migration from his birthplace is the most direct demonstration of the adaptive capacities that the species had already accomplished. With a brain size close to 900 cc, about 2/3 of the average size of modern humans', *H. erectus* was already capable of abstract speculation and complex communication well beyond a direct sensorial perception of things. This made him a human being. The unique and most discriminating qualities of humans are in fact in their imagination and in their capacity to believe in their dreams, pursuing them, no matter whether right or wrong, to the limit. After all, the Genesis story of Adam leaving Eden is symbolic of curiosity, a quest for total knowledge and ultimate damnation, well fitting the kind of responses human minds make to challenges.

The story of variation in the human species begins with the emergence of *H. erectus* around 2.0 My. It begins in Africa where different types of early hominids were living in a growing range of variation after 2.5 My, when palaeoclimatological



Figure 13:
Early man's routes out of Africa. The map indicates the main sites in the east African birthplace of humans and the main Early to Middle Pleistocene in the Arabian Peninsula and the Mediterranean Levant. The red lines indicate the main directions of movement across the Red Sea. The coastlines drawn are those of the present. During two million years, sea level changes made possible the emergence of land bridges across the straits on either side of the Red Sea. The sites indicated on the Asian side are only the best known ones and a very small fraction of those to be found by further exploration (drawing by Hélène David).

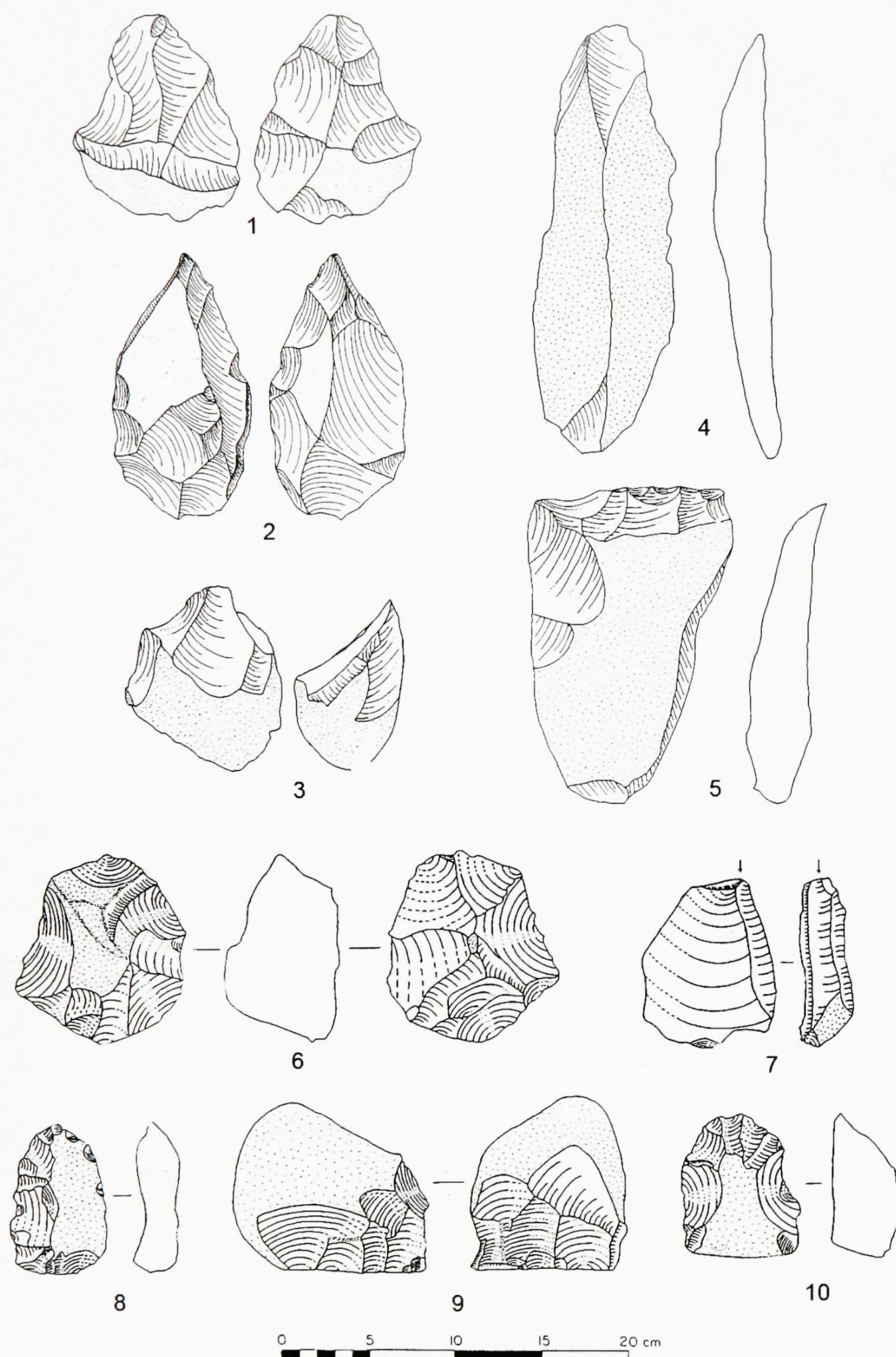


Figure 14:
Lower Palaeolithic tools from Saudi Arabia and Yemen. 1-2) Bifacial hand axes; 3) Chopper; 4) Pick; 5) Cleaver; 6) Discoïd; 7) Burin; 8) Side scraper; 9) Core scraper; 10) End scraper (drawing composed after Hizri Amirkhanov [Yemen] and Juris Zarins [Saudi Arabia]).

data indicate major environmental shifts across East Africa, leading to a predominance of open savannah parklands over earlier forests. This shift would have forced new adaptations. Several specialists are inclined to associate this with the significant increase in average brain size they have registered among all the later remains of hominids. Following 2.5 My the range of variations also increases among fossils found, *H. erectus* being just one variant. The oldest known stone tools are from Ethiopia and Kenya and date back to 2.6-2.5 My. An association with *Homo* is not definitively proved; some authors implicitly do not exclude the possibility that a 2.5 *Australopithecus* (*A. garhi?*) would have been able to produce and use these tools. Around Lake Turkana in Kenya, Héline Roche has shown that pre-olduwayan-like tools were produced at 2.33 My from distantly-sourced raw material.

Looking at the scanty remains of his artefacts, prehistorians have agreed that *H. erectus* had already developed sufficient capacity for cultural and technological adaptation to enable him to occupy areas ecologically varied and to spread over every subtropical region from his original birthplaces in Africa to Iran, India and the Far East. Controversy has centred on the timing of this early dispersal. Finds from Europe and China indicate that *H. erectus* had migrated out of Africa around 1 My, at a mature stage of his development. However, new discoveries in the Caucasus and a recent re-dating of fossils from Java have cast new light on the time of this migration, placing it about a million years earlier. The extraordinary remains of *Homo ergaster/erectus*, found at Dmanisi in Georgia, have been to dated 1.6 My, while in Java, at the extreme south-eastern end of the migration route, early dates have been derived from human remains at Mojokerto (1.8 My) and Sangiran (1.6 My). With a one million year difference, the scenario of the earliest migration bears quite different implications. Recent finds in China (teeth identified as *habilis*-like *Homo*) and dated to 1.7 My, suggest also an earlier date for his arrival in the Far East, consistent with the new dating of the Java fossils to the south. The migration of early man to Asia would have been accomplished by the end of the Pliocene, more than a million years ago, establishing conditions for longer evolutionary trajectories in each region.

The evidence, then, is quite contradictory and the specialists remain divided on its interpretation; but the relevance of the Eastern Arabian Corridor (EAC) for the controversy is beyond question. Not surprisingly, given the new discoveries in Georgia and Java, over the past few years palaeoanthropologists have begun to survey the Pliocene terraces and formations along the coast and in the interior of both Yemen and Oman with the aim of finding some direct evidence, ideally bone remains themselves, of *H. erectus* who had left Africa to occupy the subtropical lands of Arabia on his way across Asia. From Ethiopia to Arabia there are two possible migration routes that our ancestors could have taken: along the Nile and across the Sinai into Syria and Northern Arabia or cutting straight through the Bab al-Mandab into Yemen. Over the past ten years exploration has concentrated on South Yemen and the desert border of Dhofar.

The first systematic searches for Palaeolithic sites related to early man in the EAC were carried out in the years 1983-85 by the Soviet Expedition to South Yemen. Hizrì Amirkhanov, one of the leading Russian prehistorians, focused his efforts on Wadi Hadramawt, the 400 km E-W narrow highway that directly connects the southern highlands to the sea and Dhofar. Sporadic finds by American and Russian exploration teams had already uncovered here the presence of bifacial hand-axes, the most characteristic Middle Pleistocene stone tool, named "Acheulean" from the type-site in France where they were first found in the 19th century. On the western side of the escarpment, in Wadi Dauan, a tributary of the upstream section of the Hadramawt, some 150 km north of Mukalla, Amirkhanov explored the cave of Al-Guza with its complete sequence of geological and archaeological layers. The stone tool assemblage associated with these layers was predominantly made of quartzite choppers roughly flaked from river pebbles, together with a few side-scrapers on flakes, awl-like tools and polyhedrons (fig. 14). These types, together with a striking technique used to make them and the absence of associated bifacial hand-axes, would indicate a pre-Acheulean culture dating from the Early Pleistocene. However, hand-axes were found in a level above in the stratigraphical setting of the same cave deposit. Radiocarbon measurements cannot be used for these early periods and, since no associated volcanic rocks were present to invite other methods of dating, it has been impossible to give so far an absolute chronological range to the Al-Guza assemblage. There are in any case evident formal connections of the tools found with dated sites in Africa and Asia to support the proposition that they represent the earliest cultural remains of man found in Eastern Arabia. Using a combination of archaeological observations and palaeoenvironmental data, Amirkhanov has suggested that the Al-Guza sequence may cut across the Lower/Middle Pleistocene boundary line with its date of around 780,000 years ago. The lower, pre-Acheulean industry could then be dated to around 1

My, corresponding to a period of a more humid climate, comparable to the open savannah conditions of East Africa. Since the start of the Middle Pleistocene corresponds in Arabia to significantly drier conditions and increasing pre-steppe desertification, the establishment of *H. erectus* would have been taking place in environmental conditions closer to those of the African homeland.

Only five pre-Acheulean sites were found in Amirkhanov's survey of the Western Hadramawt. Twelve Acheulean sites were detected, comprising nine workshop areas identified by vast spreads of manufacturing waste and three campsites. Characteristic hand-axes were made of black basalt and flint, while quartzite continued to be used for coarser tools. There is evidence that by the Middle Pleistocene human occupation had increased all over the Arabian peninsula. So far no sites with hand-axes have been identified in Oman. But for Saudi Arabia the evidence is substantial: several Middle Pleistocene sites had already been found and explored by Juris Zarins in the late seventies in wide-ranging survey work across the central and south-western provinces. Here also there were disputable indications of Early Pleistocene occupation

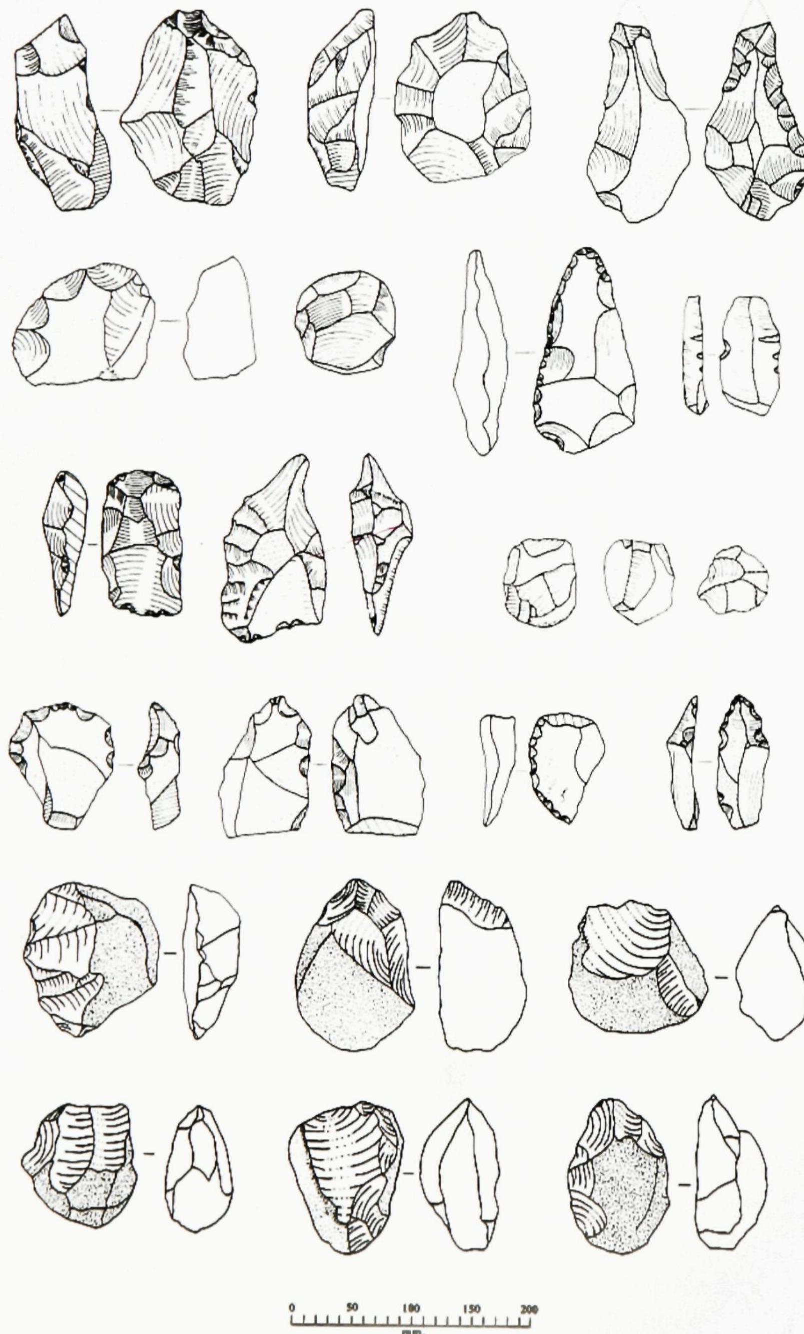


Figure 15:
Early Pleistocene tools from Saffaqah, 4 upper rows, and Shuwayhitiyah, 2 lower rows (after Whallen, Atlal 6. and Atlal 7).

at Tathlith and in the Najran escarpment near the Yemen border.

Looking for other Early Pleistocene sites, Amirkhanov also went to the area close to the Bab Al-Mandeb straits, to the west and north of Aden, exploring Jebel Tala, where, in the sixties, the British archaeologist Brian Doe had already recorded the presence of Acheulean hand-axes. In spite of these promising clues, nothing earlier was found. However, his assumption that the EAC had been already occupied by *H. erectus* at least one million years ago in connection with the "later" migration was further tested in this same area by two American specialists, N.M. Whalen and K.E. Schatte, who, in 1992, began exploration of the high escarpments to the north of Aden, in Wadi Shahar and Wadi Gadin. Whalen had already worked with Zarins in Central Arabia, where he had explored the Saffaqah Middle Pleistocene complex that we will later describe in detail (fig. 15). Unfortunately, experience without a bit of luck rarely helps: no stratified archaeological deposits were found. As usual, the only Lower Palaeolithic materials were found dispersed on the flat top of the terraces. Among them, however, Whalen recovered the same kind of pre-Acheulean tools Amirkhanov had found in the Al-Guza cave deposit: choppers, polyhedrons and scrapers. Many dispersion areas were found aligned in the deflation pavements topping the escarpments, interspersed with areas associated with Middle Pleistocene hand-axes. Here the innovative aspects of the “later” industrial complex associated with the hand-axes were more evident than in the explored areas of the Western Hadramawt. Of the 37 sites found, 27 could be safely assigned to the Middle Pleistocene tradition. Once more innovation was most evident from the counts of the materials used. Of the 729 stone artefacts from the pre-Acheulean sites, 92% of the finds were made of quartzite, with only a very occasional use of basalt and rhyolite. The 1224 finds from the Acheulean sites indicate a more widespread and differentiated use of resources: 45% were of basalt, almost 32% of rhyolites, 7% of quartz and andesite and 9% of combined chert and jasper.

The number of sites found so far in Yemen, Hijaz and Oman are enough to confirm that foraging bands of Homo erectus were definitely in Southern Arabia in the latter part of the Early Pleistocene (fig. 16, 17, 18), well adapted to the predesertic steppe environment. Unfortunately, no cultural remains have been found that can be dated to 1,8 My (as early as the jaw bone from Dmanisi in Georgia) to support the early migration hypothesis through the EAC. But the clues are numerous enough to suggest further exploration along the desert escarpments. The research will continue.

Early diversification pathways

Because diversity is the essential component of life, its mechanisms are built within each species to broaden their opportunities for success across the widest adaptive spectrum. As a result, selection early develops the options of a species for distinctive pathways of adaptive mutation. This is evolution as Charles Darwin first proposed it in 1859. Humans have been no exception. The difference is in the speed of their mutations - very fast, and, in the extent of the options available, very wide. We are not talking here about the slow biological mutations of the body. This is of little interest, considering that the human body has remained practically unchanged for two million years. We are talking about the far more rapid cultural changes daily produced by the diversification of ideas. Once the human brain developed to its critical size, individual variability would have allowed, even within the smallest and

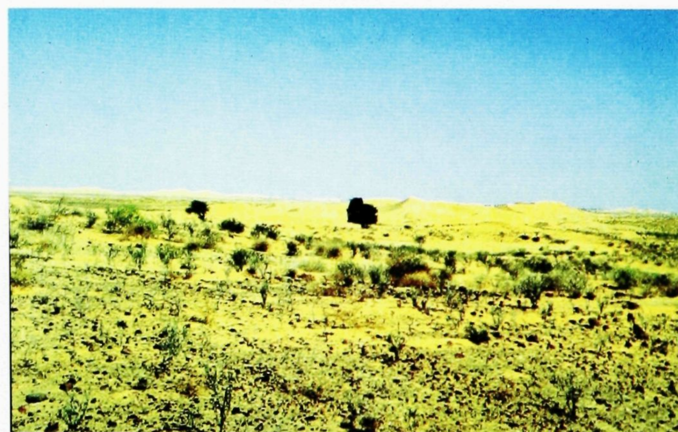


Figure 16:
View of the Saiwan-Ghunaim site, on shallow hills overlooking a dry interdunal lake. (photo Joint Hadd Project / Paolo Biagi).



Figure 17:
A random collection of prehistoric artefacts from the surface of Saiwan-Ghunaim (photo Joint Hadd Project / Paolo Biagi).

most tightly knit group of kinsmen, a wide variety of propositions on every possible issue of decision-making. Group members must have started quarrelling right away, before eventually splitting up. "Segmentation" is one of the key characteristics of the human species and indeed the immediate expression of our dreams and pursuit of freedom. Groups will keep on splitting, and the resulting splinters will keep on extending the range of humans across the planet. The Middle Pleistocene archaeological record indicates exactly this, with the widespread diffusion of hand-axes and other material indicators across the Old World. Well over 1 million years ago *H. erectus* was already living throughout Africa and Eurasia, wherever land was above water and free of ice.

This tendency to dissemination is multiplied greatly by what might have been the main flywheel for human expansion and hegemony across the earth: the incest taboo. All human cultures share the prohibition on sexual intercourse with consanguineous kin: parents, children, brothers and sisters. The few known exceptions can be isolated as the conflictual expressions of complex cultural mediations. The incest taboo has long been recognised as the truly unique characteristic of our species within the whole of the animal kingdom. The French anthropologist Maurice Godelier has identified in it the motor of our rapid growth to mastery of the planet. This is for two main reasons: first, the fact that everybody marries outside the nuclear family has the immediate effect of exploding diversity within the species, thus multiplying our adaptive options. But, even more important, it creates an open society where every individual is connected with hundreds of others in a complex web of parental relations. Human society becomes a solid building made by a multi-layered architecture of alliances, created and confirmed by the exchange of women. How can I fight this neighbour if my beloved daughter is his wife and his children are my kin? Godelier has said that while all animals have parental relations, only humans build their families as "relations of relations": not just the mother or the brother, but the wife of the son of the brother of my mother…. If two Aborigines coming from opposite coasts meet at the centre of Australia, they immediately begin listing their genealogies until they find the common name at the beginning of their descending lines of ancestors, whether real or mythical. The tools of the early Australians might look simple and primitive; not so their social structures. The same might be said of *Homo erectus*: there is no reason why this particular way of building abstract architectures of kinship and

alliance should not have taken shape a million years ago when most of the brain's complexities were already in place. The apparent simplicity of those pre-Acheulean stone tools should not deceive us. Not only should we remember that most of this material culture was made of wood, plant fibres and animal tissues that have not survived the erosion of time, but also that we might be looking at the entire evidence from the wrong perspective.

Godelier's "relations of relations" are the first human accomplishment not only in our relationships with each other, but even more in our relationships with the external world. While there are many animals that use twigs of wood, stones, bones or other objects available in their immediate environment, only humans make objects to make other objects. Only humans shape a stone or a piece of wood to work other materials. Only humans combine two or more different materials to assemble a single tool. Only humans end up turning work into the main activity of their lifetime. As a result, the transformation of nature becomes very closely combined with that of society: the change in type and distribution of tools in a given period will have significance for understanding the connected changes in human relations. This means that by looking with the appropriate methods at the stone tools and other remains of early man in their context of deposition we will be able to decode the diverse pathways of his evolution. We need, however, to make a few preliminary points to decide what to look for. First, of course, we have to consider adaptation, since this is the factor determining the scale, direction and timing of each mutation. Now, since the greater pool of diversity available to human groups makes them extremely flexible in their approach to the outer world, we should expect that the uniformity and simplicity of Early and Middle Holocene stone tools might hide a much greater diversity of cultural responses to the environmental conditions.

An effective key for distinguishing among different adaptive pathways in the evolution of early man has been proposed by a leading Japanese anthropologist, Watanabe Hitoshi, resulting from his thorough studies of the different traditional cultures that lived along the Northern Pacific rim, like the Ainu, the Aleuts, the Kwakiutl and the Shoshone. He suggests that we have to begin by considering more carefully the distinction between "hunters" and "foragers". For our purpose the term "hunter" refers to a big game hunter, not just to anyone who kills a wild animal. Likewise, the term "forager" is defined as a member of a group that lives on a broad spectrum of resources, also including some big game. Accordingly, Watanabe has suggested that we may classify the earliest societies into two types: those where "every-man-is-a-hunter" and those where "not-every-man-is-a-hunter". This occupational differentiation considers an initial splitting of two possible modes of group relations with the environment and its resources. The evolutionary perspective can be greatly influenced by these two subsistence strategies since they determine different levels of socio-cultural complexity and they might have influenced the evolution of man, at least since the Middle Pleistocene, in a direct relation to the hominisation process.

Too often archaeologists interchange rather casually the above terms. In reality their conceptual opposition can be developed into a very useful discrimination template for scanning their variability along a continuum between "hunters" and "foragers". From an evolutionary perspective, the two specialisation extremes will then be conceived as splitting forms of cultural adaptation. Hunters, foragers and their intermediates become expressions for a less dogmatic system of diversification among many possible adaptive responses.

A closer look at the life of Homo erectus in Arabia

Watanabe's discriminatory divide between "hunters" and "foragers" can be projected onto data from the only Middle Pleistocene site so far explored with analytical detail in the Arabian peninsula. It can also be used to understand, beyond the technical terms, the conditions of early human life.



Figure 18:
A sample of the stone tools from Saiwan-Ghunaim (drawing composed from AAE 5/2, fig. 4-6).

In 1979 a group of Acheulean sites was discovered by a survey team from the Department of Antiquities and Museums of Saudi Arabia 3 km south of the village of Saffaqah in the ad-Dawadmi area, almost exactly at the centre of the Arabian peninsula, 230 km west of ar-Riyadh. The main findspots were given sequential numbers, 206-76 and 206-68. Later, in 1982, there was a more detailed exploration of the sites and N.M. Whalen, with a team of Saudi archaeologists, (fig. 15) carried out a few test excavations and a systematic recovery of surface materials. Saffaqah then became the best-known Middle Pleistocene site of Arabia, the one whose features we can combine with the evidence later collected by Amirkhanov and the same Whalen in South Yemen to draw a more general picture of the earliest cultures and thus stimulate a few more thoughts on the evolutionary trends they may indicate.

The artefacts marking the sites were spread down-slope on alluvial fans descending along the slope of an andesite dyke, about 2 km apart from each other. In Pleistocene times the sloping dyke was a basin containing a small lake formed by the expansion of a river course, as indicated by the doleritic sediments still visible at both ends of the basin bowl and derived from fossil waterfalls. **Homo erectus** probably lived and worked on the

lake shore, close to either of the two waterfalls 20-25 meters above the present desert floor, which was then the bottom of the water. The pool was an ideal place to stalk any animals coming to the water. The smallest ones could be killed directly, but for the larger ones it was necessary to have the co-operation of the whole band. We know from better preserved sites of this same period in Europe and Africa that *H. erectus* and his contemporaries also used other less noble tactics to win their share of food around the water holes. Mostly they behaved as scavengers. Sometimes, acting with the whole band in screaming and jumping, a tactic they must have learned from hyenas and baboons, they would disturb the meal of a lion to snatch a carcass once the nobler hunter had moved away in disgust. More frequently, they sat around dead elephants and other large animals, butchering their corpses. Before fire became common, around 500,000 BC, meat had to be eaten raw and was almost indigestible. For the few who survived this necessary adaptation, many children and youngsters must have died.

So these humans were probably more scavengers than foragers. But let us look at the facts from the only analysed Middle Pleistocene site in Arabia. The artefacts of Saffaqah, heavily coated by black desert varnish after their long exposure,(*fig. 19*) extend on both sites for some 3.5 ha. The final count of the collected specimens was 3840 with an uneven distribution: while 3164 were recovered at 206-76, only 676 came from 206-69. The preferred raw material for their manufacture was naturally the local andesite rock, derived from the dyke itself, followed by granite, quartz and rhyolite also locally available.

The relevant evidence underlining the level of complexity already reached in this period is derived from the typological variability of the artefacts from the different clusters. Sixty-nine functional types were identified for 23 main forms. The different types of hand-axes made up only 33 tools (0.86%), versus 712 scrapers (18.54%) and 117 knives (3.05%). However, only 5 (0.13%) polyhedrons and spheroids, the types derived from the pre-Acheulean traditions, were found, while rough chopping tools numbered only 90 (2.34%), confirming the lack of continuity with Early Pleistocene technology. This multiplicity of functional types indicates that many different activities were carried out at the site. We have large cutting tools (hand-axes, cleavers, bifaces and knives), heavy duty tools (picks, choppers, core scrapers and core chisels), scraping tools (side-scrapers and end-scrapers) and small tools, the most variable and functionally specific of them (discoids, burins, borers, etc). The variable distribution of these tools among the different clusters suggests that specific performances were carried out at different places.

There were no faunal remains at Saffaqah, but Whalen has compared this with other Middle Pleistocene sites in Europe, Africa and the Near East containing very similar tool assemblages, like Torralba in Spain, Olorgesailie in Kenya, and Latamne on the Orontes in Syria. Here associated animal bones and plant remains, combined with the analyses of wear patterns on stone tools from excavations, have allowed him to prepare a reliable list of the kind of activities that could have been performed at the Middle Pleistocene sites of Arabia with Acheulean technology:

1. Stone-tool manufacture
2. Plant food preparation
3. Butchering game
4. Hide processing
5. Splitting and processing of bone
6. Non-lithic tool production
7. Perforating hides, wood and bone
8. Planing wood

Of course the most pervasive activity was the main one related to food and included butchering, with extensive use of large and small cutting tools and denticulated scrapers. Recent studies have indicated that hand-axes also were mostly used for skinning and butchering smaller game, while finer bone splitting by means of smaller scrapers allowed for a more complete recovery of highly nutritious marrow. "Non-lithic tool production" means that wood and plant fibres were more finely worked, expanding the technological base for a wider control of the environment and thus extending survival rates and life length.

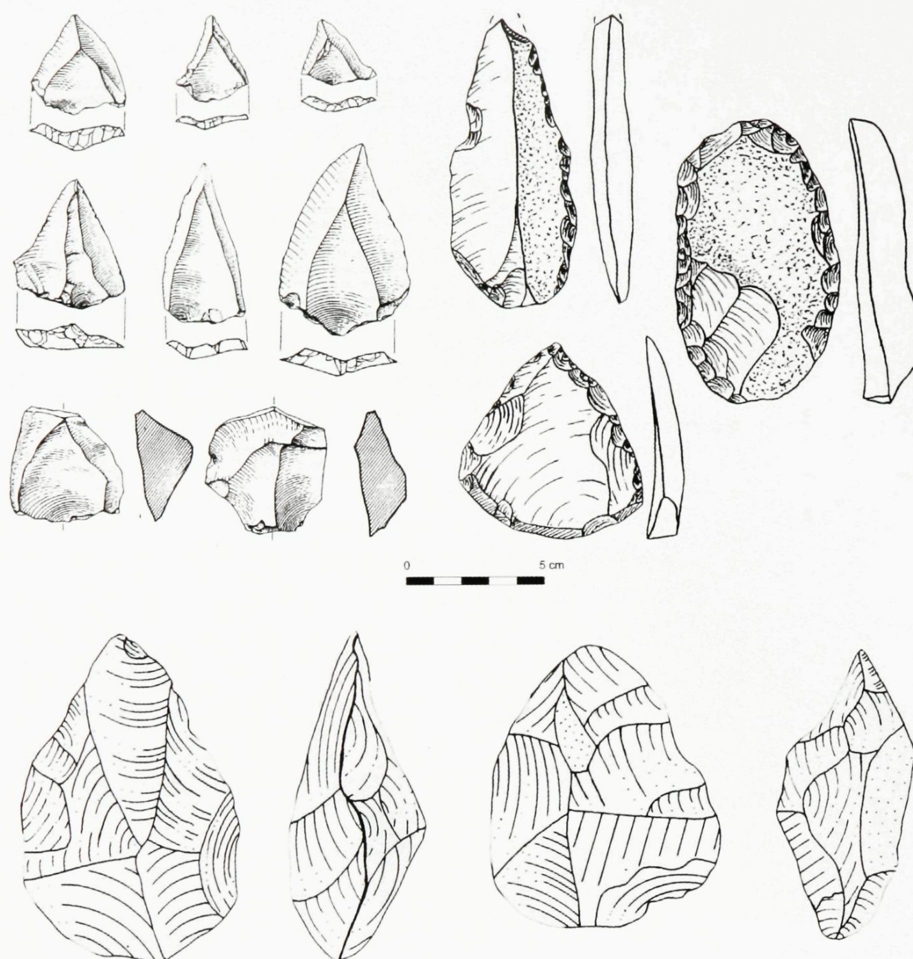


Figure 19: Middle Palaeolithic tools from various sites in Saudi Arabia (after Juris Zarins) and Yemen (after Hizhri Amirkhanov).

The fact that sites like Latamne in Syria, and many others in the Syro-Palestinian region, like Umm el-Tlel in the Syrian desert, exhibit very close typological and functional similarities with Saffaqah and the sites in Southern Yemen may indicate that while similarities in the pre-Acheulean materials with East Africa suggested a migration straight across the Bab Al-Mandab, the Middle Pleistocene people were directly associated with the Near East. The more humid climate of this period would have made accessible from the north the wide, game-rich savannah plains of the Arabian core, which were interspersed with remnant lakes and rivers all the way to the highlands' fan from the south to the east. This means that the north-south trans-Arabian corridors that would remain predominant in later times were active from the Middle Pleistocene and involved crossing the landmass through its centre before the deserts had set in. Later they would skip the desert by shifting to the Hijaz-Assir corridor along the Red Sea divide to the west, and along the Zagros foothills to the east, moving across that long plain of silt and marshes that in Holocene times the advancing sea would turn into the Arabian Gulf.

The work of Whalen and his associates at Saffaqah opened the first window onto the life of the earliest Arabians (fig. 15). That there are not yet confirmed Palaeolithic sites from Oman and Eastern Arabia in general is purely accidental. It is due to the lack of appropriate exploration in most parts of the vast desert interior and along the higher escarpments on the mountain slopes. Preliminary survey work by L. Bondioli and R. Macchiarelli around Jebel Qahwan and Jebel Khamis in the hinterland of Sur has already indicated initial evidence of varnished tools that could be dated to the Middle Pleistocene. We believe that it will not be long before the first hand-axe is found in the Sultanate (fig. 20).

If we now return to Watanabe's proposition concerning "every-man-a-hunter" or "not-every-man-a-hunter", and ask ourselves where the *H. erectus* stood at Saffaqah and in the other Middle Acheulean sites further south, we find ourselves with options



Figure 20: - Possible Middle Palaeolithic tools found on Jebel Salim Khamis near Ra's al-Jinz (photo Joint Hadd Project).

that appear still open: they are "meat foragers", still fully dependant on the body of large animals for most of their subsistence, but whose tools are being refined to deal more and more with plants, fruits, and small animals. This option will really develop towards the end of the Pleistocene, when full control of fire, revolutionary innovations in lithic technology, and a more effective social organisation to guide collective enterprises transform the timid scavengers and food collectors of the Middle Holocene into the masters of nature in the Late Pleistocene. Homo *sapiens* is a misleading name. In 1763 Cuvier, the French founder of palaeontology, would have called us "Man-the-Hunter".

Before leaving behind our distant ancestor *Homo erectus* and the unsettled life of his bands of scavengers in the Middle Pleistocene, let us give him a final thought. We know that he and his contemporaries were smart, aggressive and full of expedients. Around 500,000 years ago, their brains had already been at work for a million years, a much longer period than that separating our own times from the Middle Pleistocene. They were on the verge of using fire that would open up control of the planet. However, as in all things, there was an obscure side and a price to pay. By living in the open, exposed to the elements, and eating raw meat, their life span would hardly be 20 years. Life expectancy at puberty would have been less than ten years and in a given lifetime there could be accomplished one project only: reproduction. By looking at those varnished pieces of stone our excitement should match appreciation for our distant ancestors. Out of Eden, their minds were in darkness and they suffered like any of us would. But, whether brave or resigned, they worked hard to ensure a future for their descendants. ❑

Chapter 3

From Early Hunters to the Last Foragers

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By defining the bands of *Homo erectus* as "scavengers" we have intentionally separated them from those of their successor, *Homo sapiens*, who deserves to be called "hunter" by virtue of the fact that he had developed the skills necessary to kill all the animals he ate. His far better equipped groups emerged about 150,000 years ago and accelerated human expansion to all the continents. In the course of the Late Pleistocene they turned our planet into the "homeland of man". Australia was reached around 60,000 years ago, while the Bering land-bridge was crossed some 30,000 years later. Within less than 10,000 years of this, the American continent became populated throughout its length from Alaska to Cape Horn.

Appropriate definitions are critical for any cognitive process and prehistory is no exception. Terms like "scavenger", "hunter", "forager", and "food gatherer" are not loosely interchangeable. By emphasising that for most of his history *Homo erectus* was not a "hunter" but a "scavenger" we intend to clarify the different adaptive pathways that gave the human species mastery of the animal world. The archaeological discoveries about early man in Africa have driven back human ancestry at least two and a half million years. At this point hunting was no longer the most primitive form of human subsistence: to go out and kill a wild animal for lunch emerged at the end of a long process of learning that took our ancestors hundreds of thousands of years. To hunt requires a combination of many skills and on top of them a system of alliances much broader than those which direct bonds of consanguinity can forge.

More than a hundred years ago prehistorians introduced a straightforward distinction between Palaeolithic "hunters" and Neolithic "farmers", emphasising the wide gulf that separated one from the other. As new data increased, the picture became confused and in the 1920s the two were renamed "food-collectors" and "food-producers" respectively, though still without any conceptual change in the consolidated idea that evolution was a staircase and that its history described the gradual ascent of man to civilisation.

The most conformist views generally end up in school textbooks. For example, illustrations of prehistoric men in those texts still used during the fifties portrayed Palaeolithic hunters as almost naked, squatting at a cave entrance among a mess of bones and tools, gnawing a piece of meat, their eyes on the ground. On the next page one met the Neolithic farmer and his family (usually a wife and two children) standing dressed in cloth and looking proudly at a neat landscape of fields and flocks. One detail might have looked rather suspicious: in contrast with the horrible mess at the Palaeolithic cave entrance, a couple of brutes were busy in the back of the cave painting on the wall a most wonderful piece of impressionistic art. In the vignette of the Neolithic farmer all looked tidy and everybody smiled. But there was no art. When asked, the teacher, looking embarrassed, might have mumbled something about the messy lives of Van Gogh and Caravaggio. By now it was 1953 and some important new developments were taking place at the forefront of prehistoric research; yet before the specialists could start answering simple schoolboy questions there was still a long way to go.

The main breakthrough for understanding the complexity of prehistoric hunters did not come from new discoveries but through a critical revisitation of their societies within a global perspective. The change happened in 1966 when a leading institution for the study of man, the Wenner-Gren Foundation of New York, sponsored a proposal by two young American cultural anthropologists, Richard B. Lee and Irven DeVore, to organise at Chicago a symposium on "Man the Hunter" that would produce "the first intensive survey of a crucial stage of human development - man's once universal hunting way of life". Some forty scholars came with experience on hunters and gatherers from different parts of the world. They produced a world-wide survey that



Figure 21:
Stalking oryx at a pool. By closely watching animals early men developed a superb knowledge of their behaviour that allowed them to overcome their inferiority towards all prey animals. The bone remains from the excavated campsites indicate that well before they had acquired the control of fire humans had developed the means to catch and kill animals larger, faster or stronger than them. And this was mainly accomplished by cooperating in large groups: hence the political foundations of our evolution (drawing by Giorgio Albertini).

brought into focus the complexity and diversity of hunter societies and their relationships with the animals in their environment. When published two years later, the conference proceedings removed any prejudice about hunters' primitiveness and proved that everywhere they arose from a long process of selection. From an evolutionary perspective their variations were not "minor" differences at all, since at one end they derived from adaptive responses in their formative phases during the Early and Middle Pleistocene, and at the other they nursed a future diversity among foragers and food producers all over the world.

It is worth quoting at this point the words of Claude Levi-Strauss, one of most eminent anthropologists of our time, from the concluding remarks he read at the Chicago conference: "...we cannot consider [hunters] as belonging to a semi-animal condition of mankind (...) there is a much greater difference between them and any kind of animal society than between them and more complex human societies".

The results of the conference fell like a landslide across the sleeping valley of Palaeolithic Studies. A few of the younger participants were in fact prehistorians, like G. L. Isaac, L. R. Binford and J. Desmond Clark, who set the agenda for future research on early man in Africa and elsewhere in the world. Leaving aside the descriptive classification of artefacts that had remained the almost exclusive preoccupation of Palaeolithic Studies, they redirected their work to focus on the complexities of the hunters and their ecological relations. Since then, the efforts of three generations of archaeologists have confirmed in all parts of the world that the Late Pleistocene hunters had been far more diversified in their social structures and subsistence strategies than most of the food-producers. After all, farmers and



Figure 22: *Observing and interpreting animal tracks.* Over time this kind of activity created the opportunity for exchanges of ideas and information within the hunting party, making use of the unique human capacity for communication. (drawing by Giorgio Albertini).

pastoralists developed as specialists from predecessors who had monitored for their subsistence a much broader spectrum of animals and plants.

How scavengers become hunters

Homo erectus lived almost a million years with the capacities of a powerful brain, improving generation after generation the organisation of his habitat and the means for controlling the world around him. But he was still unable to conquer all his fears and foes. Animals were the centre of his world, the main subject of his observations, the preferred topic of his conversations. They made up most of his subsistence, but not without reciprocation. He ate them, but often they ate him as well. However, food exchanges were by no means the most significant aspect of that relationship. This was knowledge, because they were his teachers. He won because he had in his brain the software to remember and combine all the information and innumerable skills necessary to master the environment in all its aspects. He learnt from the lion stalking its prey, from frogs swimming in ponds, and from birds flying across the sky, although heavier than air. Observing animals for thousands of years meant learning from them, but first of all about them. Humans needed to know every detail about animal lives, as much as those of their predators and those of their prey. It was not just a matter of learning ethology. Complicated concepts like ecological relations, trophic cycles and food chains were not academic for them, not the indigestible topics of science classes, but imprints in



Figure 23:
Cutting up and dividing the prey. They start with the lower legs, as these are rich in fat, even during very dry seasons. Reaching common decisions, first by sign language and later by speech, developed alliances that might have gone beyond the immediate hunting circumstances and forged the pathway to leadership within close parental bonds, in widening kinship circles. Here are the seeds of Ibn Khaldun *assebiya* (drawing by Giorgio Albertini).

their minds. Before technology and social complexity alienated them from the animal world, humans were an intimate part of it. They shared the space, water, shelter and vision of many other species that lived in the same habitat. By relying on the tools he made during the Early and part of the Middle Pleistocene, *Homo erectus* could kill only a few of the smaller animals. With the larger ones he had to negotiate for everything. If they were not hunters for a very long time, they learned, each generation passing on to the next experiences, the animals lost with their lives. Scavengers knew how to stalk, track and butcher animals to get their meat, skins, horns, bones, hair, feathers, blood and guts (fig. 21-23). Hunting was developed from observation and experience. From living close to the felines and other carnivores came the most sophisticated techniques of stalking, ambushing, attacking and killing all manner of prey.

Change arrived with fire when it became accessible to all humans around 450,000 years ago. Life and health were greatly improved by the cooking of food, warmer nights, and better shelter against carnivores. People lived longer, learned more. Technical progress is evident in all archaeological sites dating from 300,000 years ago. Stone tools become lighter and with better cutting edges. Handaxes are still made but slender types are more frequent and employed for a wider range of uses. The increased number of types indicates that more functions are required to work different materials, like plants and vegetal matter. All this suggests a strong expansion of foraging activities and better control of

the natural environment. Such tools, classified by traditional prehistory as Middle Palaeolithic assemblages, are found in large areas all over Arabia on the barren surfaces of the plateaux of the Nejd or the Hadramawt. But study of them is only just beginning (fig. 19).

Changing landscapes and climatic conditions

It would be futile to engage ourselves in a description of sites and objects related to the Late Stone Age hunters in Arabia without a reconstruction of the kind of land they moved in. The landscapes we see today in Oman have been shaped by five thousand years of intensive oasis agriculture and the grazing of millions of animals across hundreds of generations. Men have manipulated water drainage and terraced most of the hillsides along the riverbeds. Millions of tons of rock have been quarried in a search for metals and building stone. Primeval forests have been cut down and new plants have invaded, carrying parasites into the remotest corners of the country. Almost all the wild animals



Figure 24 : - Driving the wild herds into a dead end. The largest food stocks in prehistoric Arabia stemmed from vast populations of herd animals that over millions of years had adapted to the dry conditions of the desert environment: gazelles, oryx, asses, camels and ostriches roamed the plains; wild bovines lived around pools and lakes along with porcupines and hares; ibex goats, hyrax and thar lived in the mountains and on rocky outcrops. Dense flights of birds, permanent and migratory, crossed the sky obscuring the sunlight, or as with partridges and hubara bustards moved across the steppes, packing around waterholes. The alliances made it possible to use fire and noise to drive herds of the plains, mammals and ostriches alike, into natural traps of gapless stone circles or high sand dunes. Later, larger human groups built the traps themselves by aligning walls of undressed stones across the seasonal migration paths where herds moved in their thousands. To the first pilots flying over Arabia after WW 1 they looked from the air like the paper kites of their childhood. Hence the name kites, used by the archaeologists to name these structures from the dawn of civilization. By assembling the work of many individuals from different groups they certainly helped to cement the bonds of alliance. (drawing by Giorgio Albertini).

have been killed. Roads, pathways and walls have been constantly enclosing space in smaller and smaller plots. Man-made change probably started much earlier, as recent studies have demonstrated the disastrous impact of fires deliberately started by men using this exclusive human power against animals or to clear forests.

Landscapes are not only shaped by men and other living species. In the long run they also, and mainly, depend on global transformation in the planet itself. During the Late Pleistocene, climates around the world changed from wetter conditions around 130,000 years ago to the dryer conditions of the last glacial period, known as the Wuermian Ice Age. The labels should not mislead us. Ice ages are mainly due to variations in the rotational axis of the earth passing through the poles. They are characterised by thicker ice caps at the poles and, consequently, a lowering of the general level of the oceans. Northern lands such as parts of America, Asia and Europe, up to the latitude of northern Germany, were covered with ice and glaciers extended from mountain peaks down into valleys. But there were fewer rains and in tropical latitudes this meant more arid conditions. During some 90,000 years of Wuermian glaciation, there were many fluctuations, with wetter periods around 60,000 and 35,000 years ago, and dryer conditions between 25,000 and 14,000 years ago (23,000 to 12,000 years BC). Sea levels that had reached some 35 metres above present ones roughly 120,000 years ago varied accordingly. By 18,000 BC, at the peak of arid conditions, they were some 120 metres below present levels. Rivers and wadis carved out deep valleys to reach the sea during periods of low waters, filling them with gravel and sediment cut from mountains during periods of higher waters. Considering that river valleys were certainly the most attractive environment for human communities and their prey, one should understand that most campsites have disappeared, washed away by floods or covered by accumulated sediment, and are only occasionally found, at times on the banks of natural cuts by modern rivers or along the many deep trenches and quarries dug for modern purposes. This has led to the discovery of large numbers of sites in Europe, where thousands of kilometres of hand-dug trenches were opened in the 19th century for canals, railways and roads, and where more recently Heritage protection laws have made compulsory the survey of any public works by professional archaeologists. But nothing of this kind is known at present in Arabia.

Hunters among plenty

The herds of wild animals that wandered across the desert, steppes and mountains of Arabia became a potential stock of resources available for human exploitation once hunting had became the basic form of subsistence (fig. 24). They comprised those species that had adapted over millennia to the hyper arid conditions predominating in most parts of the peninsula since the end of the Miocene, 40-50 million years ago. Most of them originated from the Saharan-Nilotic region, as Arabia is an extension of the African tectonic plate. The forest and wet savannah species, like hippos or buffaloes, survived only around the few permanent pools of shrinking water. Their bones have been found fossilised in old lacustrine areas such as Mundafan in Saudi Arabia or Sabkhat Matti in Abu Dhabi. Other mammals roaming the dry steppic environments included asses, gazelles, camels, oryx, and ostriches, while ibex and mouflon grazed in the mountains. Smaller animals like the porcupine, hare and hyrax, and many others were also possibly present. During low water levels, and especially between 25,000 and 12,000 BC, the Gulf, nowhere more than 80 metres deep at present, was a huge plain at the foot of the Zagros mountains, partly covered by extensive marshes crossed by single or multiple branches of the Mesopotamian rivers. It was an extremely attractive environment for animals and human bands of hunters, who could also have exploited fish, shell-fish, crustaceans, reptiles and birds. The importance of this lost province of Arabian prehistory has still to be understood.

A succession of camps and butchering sites covering a time span between 100,000 and 50,000 years ago and recently found at Umm el-Tlel in the Syrian desert provides a vivid picture of life in those times. Bands of hunters came every year to camp on the edge of a lake that shrank into a pond according to the fluctuating flow of an artesian spring, and their



Figure 25:
Trapping large and small animals with nets and pitfalls. Individual mammals and small herds could be ambushed into pitfalls or caught in snares. Contemporary rock art all over the Saharo-Arabian region prove the widespread use of such devices from the Late Pleistocene. Nets could be woven from several kinds of grass, to catch not only small mammals but also the clouds of migratory flights of smaller birds, like finches and starlings. (drawing by Giorgio Albertini).

remains have been preserved by the deposits left by these water bodies. Yields here include not only flint tools but also tools made of bone and wood. Flint points of a type known as Levallois flakes, dating from ca. 60,000 years ago, still wear the remains of the bitumen that was once used to fix them onto a wooden shaft. Bitumen was also used to make beads. Groups of scratches on a small stone slab dating from around 75,000 years ago may be interpreted as engraved signs, one of them representing a human being. Traces of temporary brushwood shelters were also found, together with a row of stones and clay near a fireplace that may have been used as a bench. Large mammals such as wild asses and dromedaries were hunted and butchered, brought to the site as complete carcasses (asses) or quarters (camels) to be processed for further consumption.

Similar sites may have existed in Arabia itself, at least during wetter periods, but they have not yet been found. Within and around the country's vast desert core, stretching from the Nefud depression to the Ramlat as-Sab'atain, there are ecosystems which differ considerably from one another, from desert to marsh and from low-lying alluvial plains to high altitude valleys. For hunting and gathering economies this environmental diversity provides the indispensable guarantee of a continuous food supply throughout all the seasons of the year. The plants and animals we feed on have precise biological cycles and the main problem for primitive communities was to assure themselves of a continuous food supply. Before they developed effective strategies of accumulation, such as animal domestication, the storing of primary resources in permanent settlements, or bulk exchanges of goods, human communities were forced to manage as best they could by balancing their movement and division of labour with the cycles of the biological species living in their territories. Most of these ecological compartments, each with its distinctive population of animals and plants, are present in Oman and this diver-

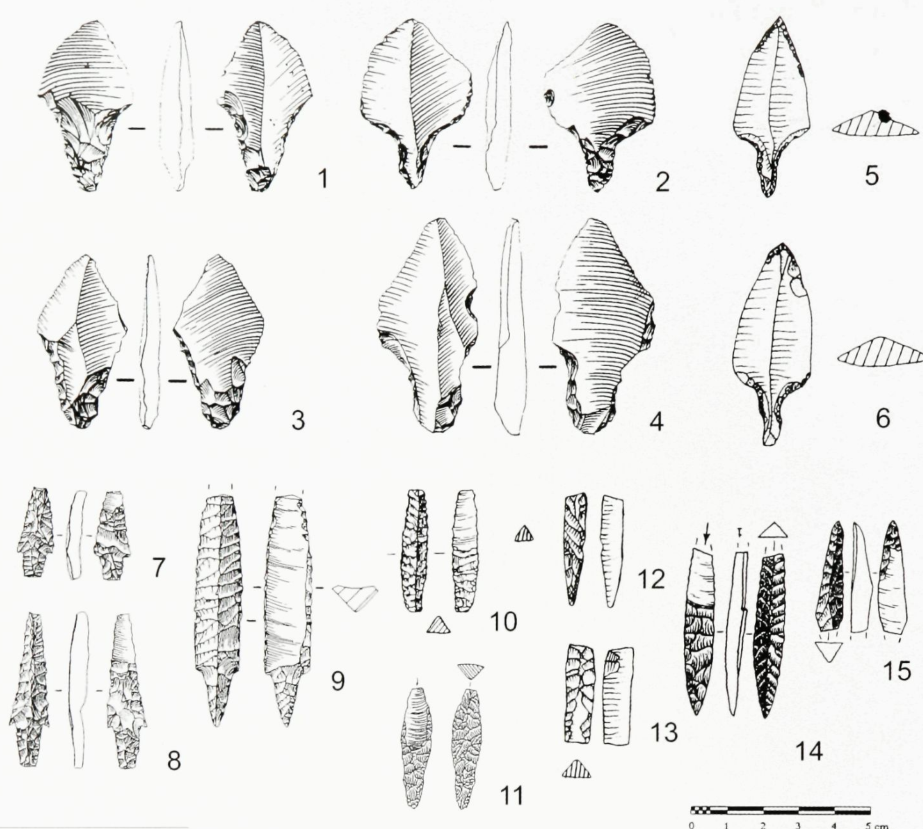


Figure 26:
Shooting. By the beginning of the Holocene, ten thousand years ago, the hunter-gatherers of Arabia were equipped with a wide variety of weapons to hit animals at a distance of 30-50 meters and beyond: javelins, bows and arrows, stone bolas and propellers to launch short pointed spears that could be driven through the thick coats of the larger mammals. By the combined use of driving and shooting the herds were rapidly depleted. By 5000 BC the bones recovered from archaeological sites indicate that the meat from wild animals was a minor contribution to the diet of the semi-nomadic groups of herders. The coastal biomasses from the sea and the brackish waters of lagoons became the new larder, with an endless supply of fish, increasingly exploited throughout the Middle Holocene, while agriculture started to build up a new means of life across the depleted interior. (drawing by Giorgio Albertini).

sity guaranteed a wide range of options with limited seasonal migrations: the fact that so little is known at present should not be taken as an indication that the land was empty.

Many prehistorians are indeed of the opinion that Arabia was in human terms completely depopulated during the peak of aridity. This view is based on the absence here of a new assemblage of many flint tools mainly obtained by the systematic production of blades from cores and not, as before, from large flakes (the Levallois points) or from shaping the cores themselves (the hand-axes). Known as "Upper Palaeolithic", these new flaking techniques appeared in Europe and in the Levant during wetter climatic conditions about 40,000 years ago. Tools made of bones or antlers are abundant on well-preserved sites, some of them bearing engraved decoration. This corresponds in Europe to a period of great achievement, including magnificent engravings and paintings, both in caves, like the recently discovered Grotte Chauvet in the Ardèche valley of southern France, and in the open air, such as the exceptional discoveries of the Foz Côa valley in northern Portugal. During this period, a wetter climate in Arabia made possible the presence of abundant fauna, including large mammals, notably along the riverine corridors and by the lakes, and we can probably take it for granted that humans were also present. A single site, dating from around 25,000 BC, and situated in the Mundafan area of Saudi Arabia, is characterised by large stemmed points with bifacial retouch. Similar tools have been found at various places in the Hadramawt. These objects can be compared with contemporaneous assemblages in the northern part of Africa, but are very different from the Upper Palaeolithic tool kits of the Levant. From this date to the beginning of the Holocene, around 10,000 BC, we do not know of a single securely dated site in the Arabian peninsula (fig. 26).

During this same time span, the Upper Palaeolithic communities of Europe went through the rigours of the last and most intensive peak of the Ice Age with a permanent influx of new types of objects. Some groups adapted to the peri-arctic conditions, following the herds of reindeer across the tundra vegetation that covered the French and

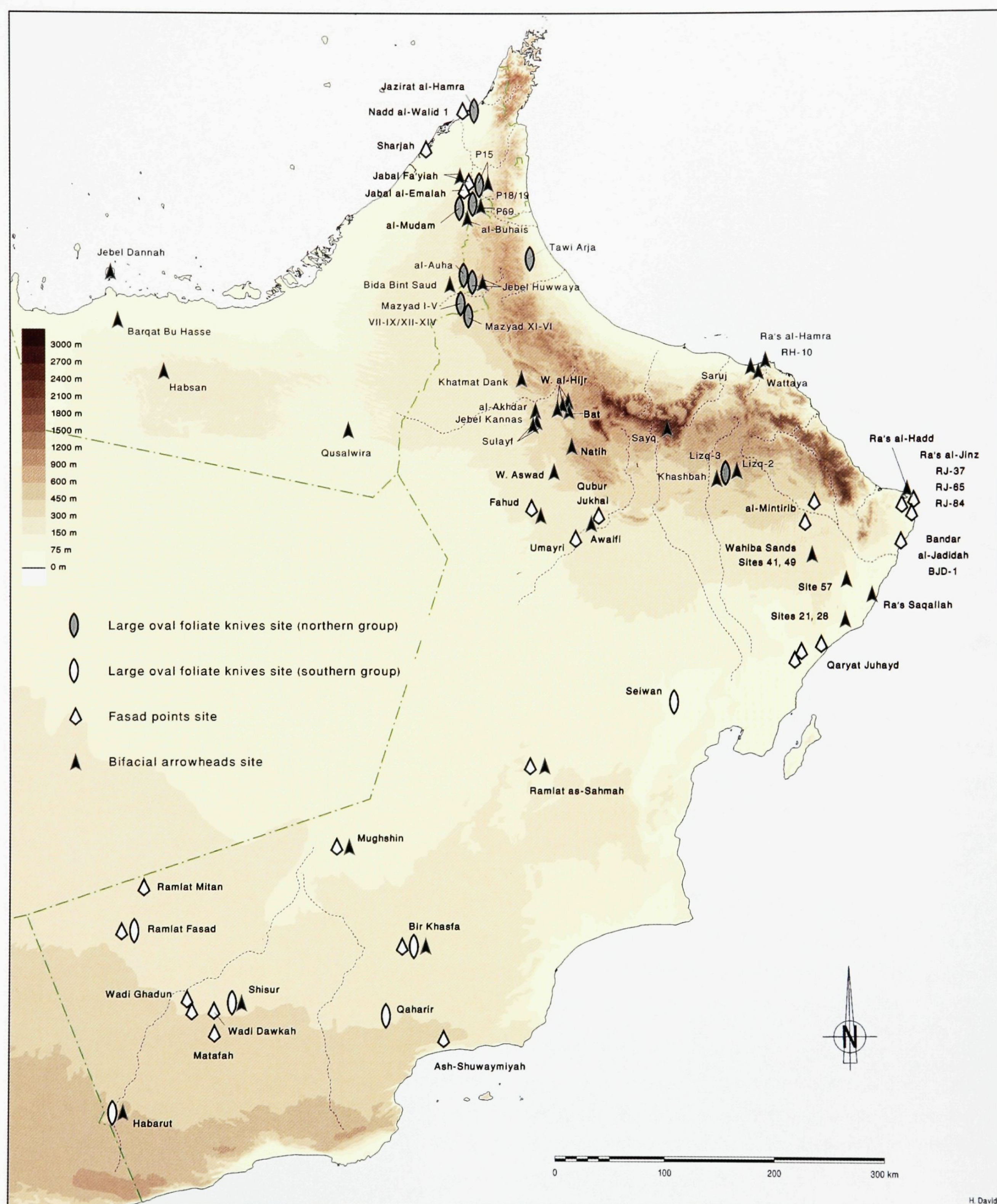


Figure 27 – Hunters and foragers in Oman during the Early and Middle Holocene. The points and names on this map indicate the uneven state of archaeological exploration in Eastern Arabia. Coastal exploration has been concentrated between Muscat and the Sharqiyah sands, resulting in the denser crowding of sites in the East. The empty parts are those where little or no exploration has taken place so far. Also in the wind-blown desert areas of the interior sites are detected by very inconspicuous remains. Shell middens on the coast are easier to spot than isolated flint scatters of the interior. We expect that the Middle Holocene foragers and early food producers occupied and exploited every corner of the country cutting across all landscape forms to exploit all ecological niches, from the innermost desert basins to the offshore islands. Where the map lies most is in its true centre, around Jebel Akhdar. This is one of the richest areas of Arabia in terms of biomass and resources, yet we have no sites to mark. (Drawing by Hélène David).

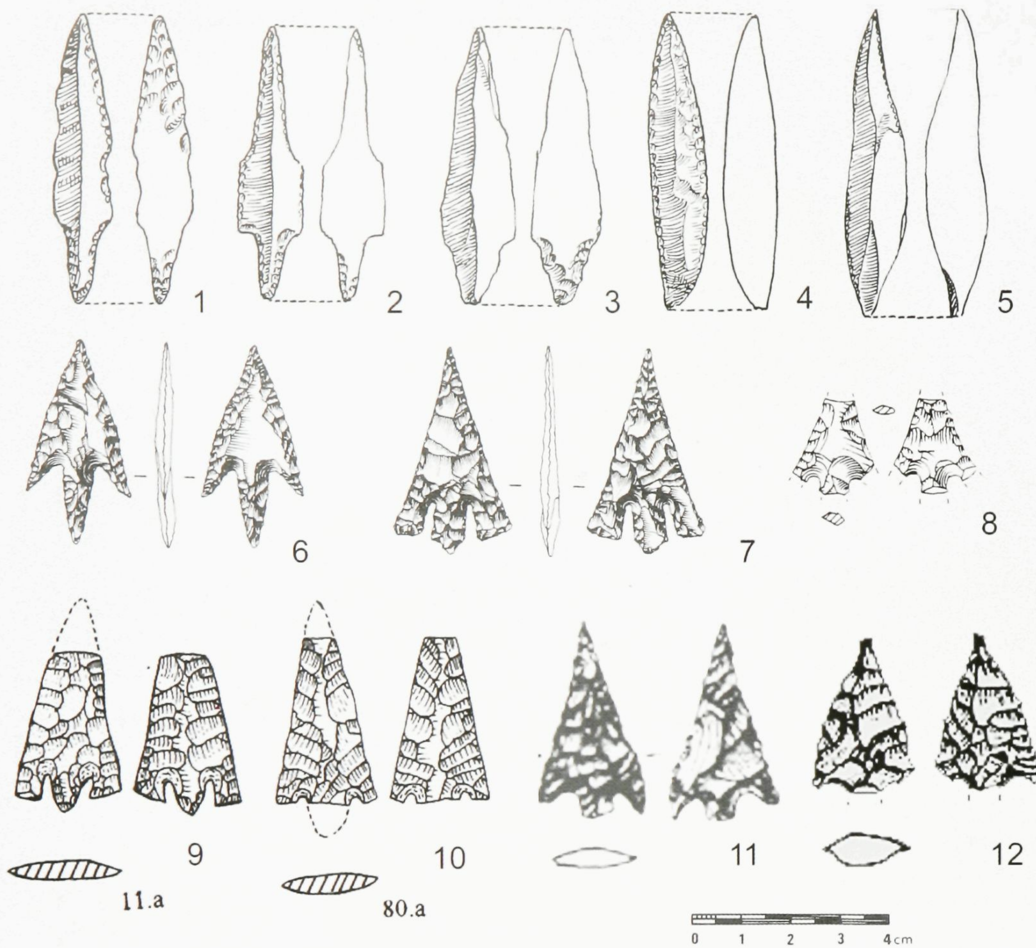


Figure 29:
Early to Middle Holocene flint points of the Fasad type, probably used as spearheads during the Early Holocene. They might have been associated with game drives. They are found all over Eastern Arabia, from the desert of Dhofar to Qatar. These specimens were found at site BJD-1 near al-Hadda, Eastern Ja'alan (Photo Joint Hadd Project).

German plains, while others managed to survive on an almost sedentary basis in the valleys of southern France and Spain, still producing major cave paintings such as those at Lascaux or Altamira. This was the time of the lowest sea levels, some 120 metres below present figures, and a painted cave like Grotte Cosquer near Marseilles could be entered from an access along the slope, now flooded under more than 30 metres of water. Among its rich painting are seals which in those times flourished along the northern Mediterranean coast. More than the absence of known sites at this still preliminary stage of research, it is probably a result of prejudice that most prehistorians suppose that adaptation to aridity was impossible. Human groups may have deserted the most arid regions, but animals were still plentiful in some places and the river valleys could still be inhabited. The same was true for the rivers and marshes of the Gulf. The fact that nothing can be found at present, due to later covering by sediment or water, does not allow us to conclude that Arabia was empty.

Figure 28 :
Two typical items of late Omani prehistory (late 7th to late 5th millennium BC): Fasad points (two rows top) and trihedral arrowheads. The latter are now known from Hadramawt in Yemen to Ra's Al-Hadd in Oman (after Cleuziou 2005, fig. 7).





Figure 30 : Tethering stones of varying size and shape found in the Ja'alan: 1, 3-5 and near Shisur in Dhofar: 2 (Photo Joint Hadd Project).

Widespread scatters of large points and Levallois flakes in the Middle Palaeolithic tradition intersperse most of the Arabian desert areas, overlapping on the same spot with blade-based industries and small foliate points of a Late Stone Age type (fig. 26). They can be interpreted as indicating a continuous occupation of hunting grounds throughout the Late Pleistocene into the Early Holocene. A direct relationship can be assumed between, on the one hand, continuity of occupation and resource exploitation and, on the other, the ethnic developments of the population. Some areas may have been more favourable, like the margins of the Fertile Crescent to the north or the present-day flooded riparian forests and marshes of the Gulf to the east; but we may confidently assume that Arabia in general remained settled by bands of hunter-gatherers throughout the whole of the last Ice Age. The densities of animal herds and human population may have fluctuated according to the vagaries of climatic change, and also their distribution across the country; but rather than assuming a re-population from outside in the Early Holocene, we had better assume that Arabia, and Oman as part of it, has been a region of demographic stability with a steady but low inflow of immigrants, fluctuating between gradual acculturation and discontinuous accumulation.

From hunters to foragers

The situation would have changed very rapidly during the Early Holocene, and more precisely after 9000 BC, when the archaeological record indicates a multiplication of campsite remains all over Arabia. By this time intensive hunting and foraging, uninterrupted throughout the Late Pleistocene, had certainly reduced the wild herds in the temperate regions of the Near East and along the Nile corridor. All over this vast region, the would-be Fertile Crescent and the homeland of oriental civilisations, incipient forms of agriculture and animal breeding were progressing well, consolidating permanent land-holdings around the establishment of the first villages (fig. 27).

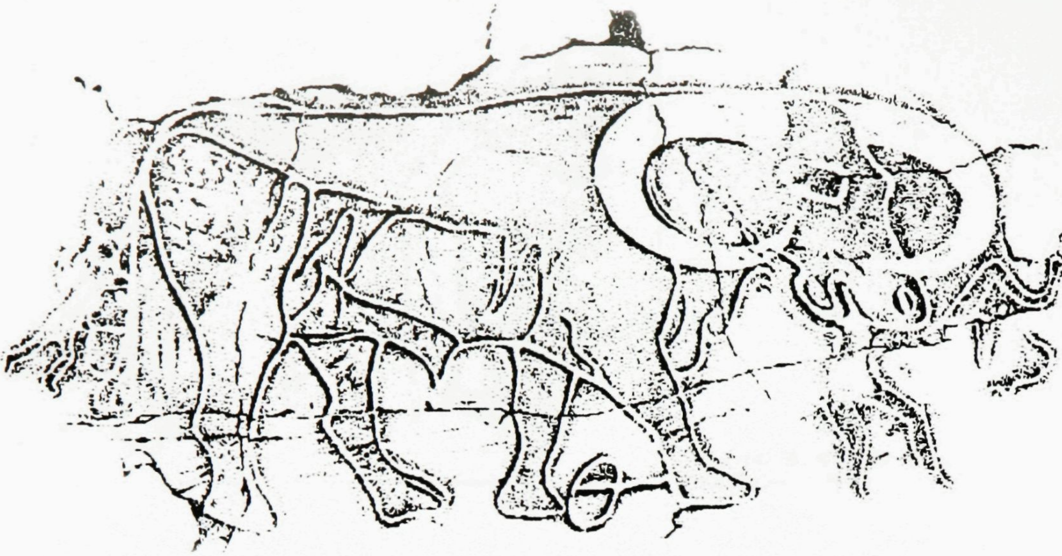


Figure 31:
This famous example of Saharan rock art represents a large bull with a tethering stone attached to a foreleg, surrounded by humans whose attitudes are a subject of controversial interpretation.

Again we need to begin with a few theoretical considerations. A society that for its subsistence depends almost entirely on hunting big game is one where at the end of each day the food brought to the table comes almost exclusively from the work of young males. Consequently their power is total and the society is far more rigid and conservative than one working in several directions at the same time, where food is brought in by the contribution of everybody, not only the fittest and strongest. Moreover, when a group depends for its subsistence on the meat of wild animals it will tend to specialise in a few big mammals, as do the reindeer hunters of the tundra or the seal hunters in the peri-arctic regions of Eurasia and America, and to follow them in their seasonal migration, with very little attention to other resources in the territory they cross. In the end they will become some kind of symbiotic parasites. "The walking larder" was the happy definition proposed by a British specialist a few years ago to explain succinctly the attitude to these animals exploited by all "every-man-the-hunter" groups.

The world of foragers is far more complex, directed as it is by a strategy of overall intensification of the resources available in the territory under group control. This multidirectional exploitation of all environmental niches and trophic cycles is a system for adjusting the diversity of human populations as a whole to that of the territory around them. The keystone of this strategy is a division of labour according to sex and age. But natural skills, diversity of training, family traditions, and personal inclination also play a role within the main divisions. Under conditions of intensification and global exploitation of the environment, foragers are immediately identified because in the local group everybody works. The division of labour involves the participation of all group members regardless of sex and age, and at the end of the day the food is supplied even by the children. Ethnographic comparisons with known populations of the recent past allow us to be more detailed. In Africa boys began hunting at four years of age. This is no surprise considering that average life expectancy was only a little over thirty years. Equipped with a sling or a light bow, they daily walked the bush around the settlement in small bands of kin, for 3-4 hours, aiming at rabbits, lizards and small birds. This is intensification. Also children's play becomes an integral part of subsistence strategy. At the same time of the day parties of women with the smallest children collect plant food of different kinds, plus honey, insects and snails. Elders are not a useless burden, but keep their high status by performing duties requiring less energy input but greater know-how. The old men take care of weirs and traps, while women carry out curing procedures to preserve stored food, like salting and so on. Water, an essential component of human subsistence, demands a different cycle. Ethnographers have observed that its supply makes an independent sector in all primitive economies around the world: while women and children fetch and carry it, men have to dig pits and wells.



Figure 32:
Mountain caprids finely carved near Shena. These represent wild caprids, but raise some questions. They look more like ibexes (Capra ibex), an animal common in southern Arabia where it is extensively represented in South Arabic art of the first millennium BC, but which does not exist in Oman where it is substituted by the Arabian Thar (Hemitragus jakayari). This raises the question of the origin of the Arabian Thar, which is rather close to the Indian one, but is also supposed to be endemic in this region of Arabia. Only DNA analysis can give an answer, but archaeology too may help (photo David Insall).

To complete our reflections on the dividing pathways of social evolution, we ought to take into account another factor of discrimination determined by early choices in subsistence strategies: the storing of food as opposed to its total consumption. This involves the creation of subsistence surpluses during seasons of abundance. The French anthropologist Alain Testart has established a classification for primitive societies between those who share their food surplus and those who stockpile it. In his attempt to develop a comprehensive theory for the origin of inequalities and the division of labour, Testart has claimed that complexity will develop at a much higher rate and degree among the storers than among hunters who share the extra food, like the Mbuti pygmies of Congo or the !Kung Bushmen of Namibia.

The techniques of storing food vary greatly across the ethnographic record. They not only include such passive devices as pits or other closed containers, but also a large number of curing techniques like the salting of meat or the drying of grains and fruits. The aim is to lengthen the life of the most nutritional parts of animals and plants, postponing their rotting by sealing them in anaerobic spaces to reduce the action of bacteria and pests or by their transformation into something else. These activities have had far-reaching consequences that have moved far from the original intentions of early foragers. When milk becomes cheese, and cheese is aged in parmesan, or when apples become calvados or grandma's pies, they are turned into an economic resource. At this point they gain exchange value and can be bartered for something else needed. Preservation through storing and transformation is the physical basis for trade and the beginning of wealth accumulation.

In the opposite strategy of food sharing there are also far-reaching consequences - political more than economic. The groups that lived in places where large game mammals were so abundant that members could remain "every-man-the-hunter" knew no sophisticated techniques for diversifying and curing all kinds of food and did not develop facilities for storing resources. This means that neither surplus was created nor the needs for its management. Extra

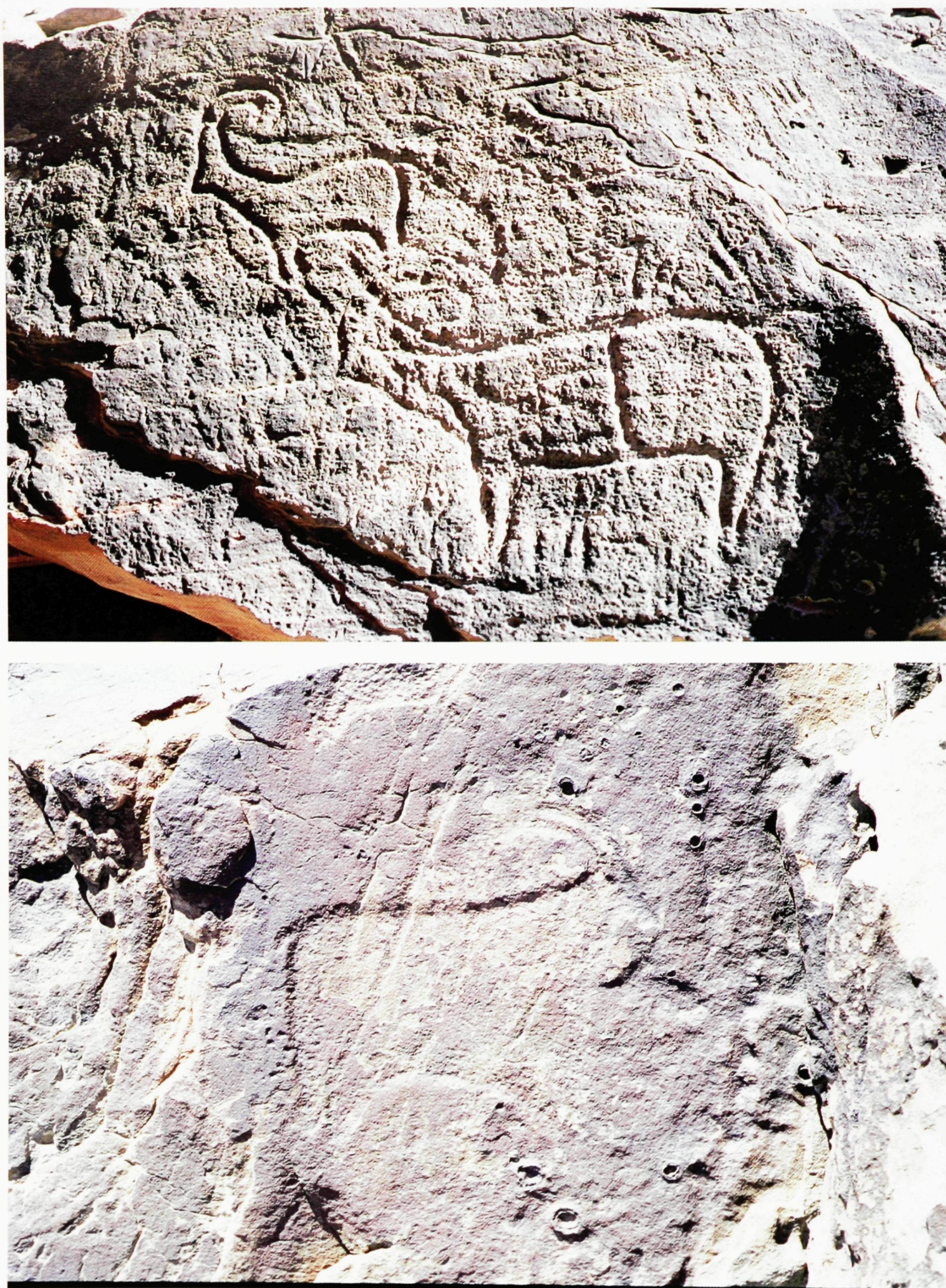


Figure 33:
Wild asses and ibexes are represented on this large engraved panel under a rock shelter close to Rada in Yemen, possibly dating from the 5th or 4th millennium BC. Wild asses were heavily hunted in the Arabian Peninsula during the Middle Holocene period (photo Serge Cleuziou)

food collected in seasons of abundance was rapidly disposed of by sharing it with other members of the community during festivals that would renew the vital bonds of alliance among the different clans, and even with animal scavengers. However, there were no losers either. On the one hand, magnificent knowledge of animals and their environment was a major asset for the later development of pastoralism; on the other, sharing practices made their societies very coherent, with increasingly strong bonds of group identity.

For the transitional millennia between the end of the last glacial period and the beginning of the Holocene, archaeological information is extremely rare in Arabia, and a specialist has proposed that we dub this period the Empty Quarter of the Holocene, by association with the Empty Quarter desert of the Arabian peninsula. We have already seen, however, that, considering both the geological conditions and the small amount of research done, sites from this period could easily have escaped the attention of the few researchers working in these immense areas. As a matter of fact, the earliest site found in Oman is a fireplace at the bottom of a sounding in the gravel terrace of Wadi Wattaya in the Capital Area, dated by radiocarbon to between 9000 and 8500 BC. Beyond that, no site yet discovered in the Sultanate is older than the 7th millennium BC. Most discussion is centred on what is known as the Holocene climatic optimum, a period when, due to the progression of the monsoons northwards, the rains were less rare in Arabia than nowadays, and also better distributed throughout the year, with summer rains, at least occasional, supplementing more frequent winter rains. This would certainly have produced better grasslands, more trees, more food and therefore more animals. Various palaeoclimatic studies would broadly place this moister episode between 9000 and 5000 BC, with some variations throughout this period. The last reminder was around 4000 BC, before the current aridity was established when the monsoonal northern front retired to the south in the early 4th millennium BC. There is no doubt that this period was more favourable for hunting and foraging communities, but concentrating on this sole factor to explain the evolution of populations in Arabia would certainly be as misleading as ignoring its importance.

From this period in Oman we mainly know about wide scatters of flint tools across the whole country from Dhofar to the north. Rather heavy stemmed points known as "Fasad points" (from the Ramlat Fasad where they were first found in Dhofar) characterise this period down to the beginning of the 5th millennium BC (fig. 28-29). They may have been used both on arrows and spears. In Dhofar and the interior they are found on the edge of fossil lakes or on barren rocky plateaux. At the easternmost end of the country, in the Ja'alan, site RJ-37, which occupies the summit of a small eminence between two large rocks, mainly comprised fireplaces and a semi-circular alignment of stones that may have been the base for a light shelter. From there the view could embrace the whole steppe and it was a perfect position for a group of hunters watching throughout the day the movements of wild herds. Several other sites are located near the coast; but one should remember that at this time the sea was much lower and it is difficult to tell if these sites were involved in hunting, in fishing, or in both activities.



Figure 34: Engraving of a camel on a mid-3rd millennium grave at Umm an-Nar (after Frifelt 1991). They were hunted but are not likely to have been domesticated until the end of the 2nd millennium BC (see chapter 10).

Another indication of hunting in the Ja'alan steppe is represented by a particular type of object called "tethering stones" (fig. 30). These are elongated



Figure 35:
Umm Al-Qawayn 2, collective burial from the mid-5th millennium BC (photo Carl Phillips).

stones of various sizes with a groove made by hammering around the middle. Such objects are well known around the same period in Saharan Africa, both as actual items and as representations in rock art. They can be seen attached to a back leg (and sometimes a fore leg) of various animal types such as bovids, caprids, equids, ostriches, rhinos and giraffes (fig. 30-31). They range in weight from four to seventy kilograms, an indication that animals of varying size were also hunted in Oman. Two possible interpretations can be derived from this evidence. One is that these stones were elements of leg traps, attached to a rope ending in a loop with a running knot that was arranged around a hole and tightened around the leg when the animal stepped into it, later constraining its movements so that it could be captured alive and possibly kept for some time. Another possibility, non-exclusive, is that such stones were attached to the leg of more or less domesticated animals in order to keep them on a given territory. In the Ja'alan they are found by the dozen on barren terraces where few animals would venture today. But we now have evidence that during the moister times of the Holocene climatic optimum these were covered with grass and shrubs. Several hundred stones have already been found and we may assume that thousands were made, indicating that the inner



Figure 36:
Various foliate tools of flaked flint (8th to 4th millenium BC). (after Cleuziou 2005, fig.8)

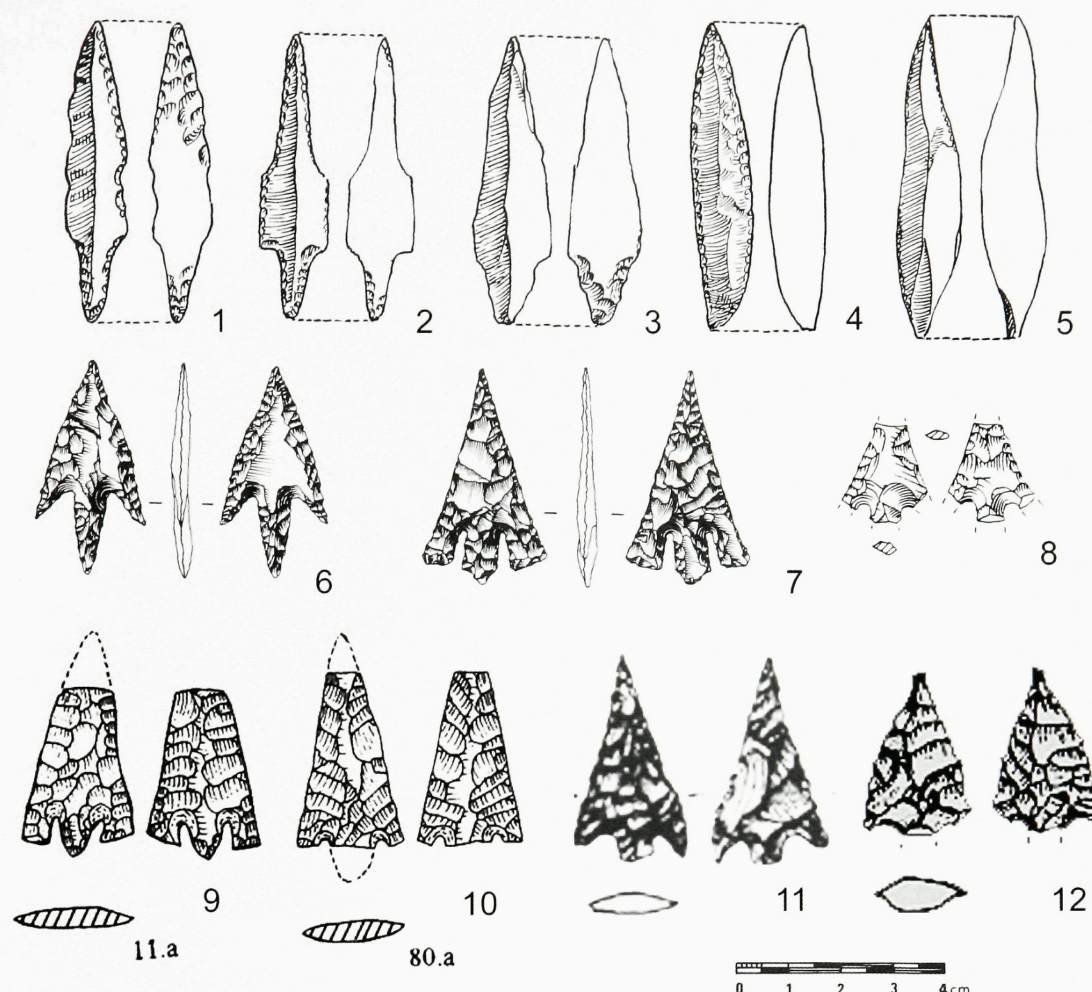


Figure 37: Arrowheads of the Qatar B group (8th-7th millennium BC, upper row) and of the Qatar D group (6th-4th millennium BC). (after Cleuziou 2005, fig. 6)

steppe was a rich hunting ground, if the "traps hypothesis" is accepted.

The question of traps is a very important one in late Arabian prehistory. In the west, from Palestine to Yemen, low walls, sometimes several kilometres long, are found running closer and closer in the landscape to eventually create a small enclosure. These constructions, known as "kites" because of the shape they present from the sky, are interpreted as drives, through which complete herds of animals were pushed by dozens of beaters (fig. 29) until they reached the enclosure, where they were slaughtered by other hunters equipped with throwing spears or bows and arrows. This is a complete change in hunting methods. It is no longer a question of killing an animal for the next meal but of killing as many animals as possible, and the group of hunters may involve the joint efforts of several bands. This cannot be done every day, but it produces food for everybody, possibly eaten in large collective meals. Ethnographic examples even show that only the best pieces would be eaten and the remaining carcasses abandoned to hyenas and vultures. An alternative hypothesis would be that part of the food was transformed for delayed consumption, possibly away from the slaughtering site. We find here the two evolutionary pathways suggested above. Both are possible and we cannot be decisive on the basis of present evidence.

No "kites" have been found in Oman and in north eastern Arabia and we cannot therefore be sure that such drives took place in these areas. However, it is well known that in many places drives can be made with vegetal barriers, or even by using beaters, placed at strategic points, making a noise and using fire to frighten the animals, as was still happening in the last century in southern Africa. This was probably possible in the savannah-like environments of the Holocene climatic optimal, but such structures leave no archaeological traces. Many other traps and hunting methods could have been in use. A beautiful rock carving found near Bilad Sait depicts several



Figure 38:
Three bitumen beads near the one of the skeletons at Umm Al-Qawayn burial. Bitumen was imported from Mesopotamia already in those times, through the same circuits that disseminated Ubaid Pottery all along the Arabian coast of the Gulf (photo Carl Philips).

men accompanied by dogs surrounding an ibex caught in what looks like a net. There can be no certainty about the exact date of this important piece of Omani rock art, although the presence of the ibex is certainly an indication of rather ancient times.

What is important is that during a period when, partly due to much better climatic conditions, herds of large mammals were abundant, hunting became highly intensified, involving more hunters for much more prey. We know of very few sites showing the bones of hunted animals; but abundant and rich rock carvings in Yemen (fig. 33) and western Saudi Arabia, and less numerous but interesting ones in Dhofar and northern Oman, tell us of the wealth and variety of animals in these areas. Wild asses, ibexes, gazelles and ostriches are among the most represented animals, at Shinas in central Oman, or in Wadi Wattayah in the Capital Area (fig. 32). It is extremely difficult to date these representations and often several periods are associated on the same rock face, some of them being fairly recent, with representations of horse and camel riders. But the earliest ones have been safely dated to the 6th millennium BC in western Saudi Arabia and the same dating could occur in Oman.

Several archaeological sites in Arabia can be associated with intensive hunting. One is ash-Shumah, north of Hoddeidah in the Yemeni Tihamah, where wild asses were being hunted on a large scale by the middle of the 7th millennium BC. Another is Aïn Qannas, near Hofuf in eastern Saudi Arabia, where the same animals were hunted a few centuries later; and a third is Umm Dabbaghiyah in the steppes of northern Iraq, where, during the late 7th millennium BC, onagers and gazelles were massively hunted and their carcasses stored and processed in special mud-brick buildings, comprising many small square chambers. At least in this lat-

ter case it is obvious that the cured meat, and possibly the hides and other by-products, entered the local economy. In none of these sites, however, was hunting the sole economic activity. The people of ash-Shumah or Aïn Qannas probably already had some domestic cattle.

Several conclusions can be drawn from reflection on these drives and on large-scale hunting. From a social point of view, they must have brought together several bands to reach the required number of hunters, with each man taking in the process a role that had to be assigned within the larger group. This was co-operation on a rather large scale, for hunting and possibly for food. But it also had its negative side. Such large killings for the needs of a much expanded population no longer incurred the marginal reduction of one of the species living in a given region. They involved major cuts in the animal populations with the potential for serious loss of balance over large areas. We reckon that by the end of the 6th millennium BC, when the climate was slowly becoming dryer again, the rich herds of large mammals and ostriches had already been drastically reduced by the action of hunters (fig. 39). Impoverishing climatic conditions, with much less rain and consequently less food, combined to worsen the situation: hunting on a large scale became no longer a rewarding and feasible way of life and had to be abandoned.

Fishing and Foraging along the Coast

With the melting of the polar ice caps after 15,000 BC, the general level of ocean waters rose rapidly. By 12,000 BC, the lowest parts of the Gulf, between present-day Qatar and the Strait of Hormuz, were flooded and by 8000 BC the water was still 30 metres below its present level. Vast areas that in the last century were pearl fishing zones, and that are now occupied by offshore oil activity, were still barren lands. They were progressively invaded by shallow waters that formed sounds and channels, with vast lagoons fed by freshwater, allowing the development of large reed and mangrove swamps between the sand ridges left by late Pleistocene dunes that were progressively reworked and destroyed by erosion. This was a constantly changing landscape with wide areas flooded within a few years; but it was also a very rich environment for foragers who were able to use traps, not for hunting but for fishing. The first fishing techniques did not use lines, hooks, boats and floating nets, but various combinations of permanent reed and brushwood barriers and keep nets that can be considered for fish as the equivalent of kites for land mammals. These areas are likely to yield rich underwater archaeological sites, once adequately explored, but we still have very little information about them: they are a challenge for future archaeological research. The earliest known sites date from the time waters had



Figure 39: Ostrich egg-shells and two flint arrowheads from the surface of an Early Holocene site. As among the Bushmen of the Kalahari, with the total lack of ceramic containers ostrich shells were certainly used as vessels to carry water. This explains their widespread occurrence across the desert lands (photo Maurizio Tosi).



Figure 40:
The postholes of circular huts are associated with various pits and floors in this layer of as-Suwayh SWY-1, dating from the mid-6th millennium BC. The dwelling was made of a few wooden posts that sustained a light canopy of grass mats and twigs (photo Joint Hadd Project).

reached their present level, around 5000 BC. They belong to fishing communities with a long tradition of using the marshes and reeds. The postholes of their round houses have been found, for instance on Dalma island, and remains of their bitumen-coated reed boats have been recovered at Ayn as-Sayh near Dhahran in Saudi Arabia or at as-Sabiyah H3 in Kuwait.

The Gulf communities did not live in isolation. To the north, on the Mesopotamian plains, the agricultural and pastoral village communities had developed a rich culture. People lived in large mud-brick houses and, from 6500 BC, they made use of pottery. It was a real surprise for archaeologists to find pieces of this painted ware, known as "Ubaid type" pottery, along the Arabian shores of the Gulf, notably those facing Bahrain, but also in Qatar and even at some distance inland at Aïn Qannas in the Al-Hasa oasis of Saudi Arabia. These sites were first interpreted as the temporary campsites of Mesopotamian fishermen during seasonal expeditions into the Gulf waters. Archaeologists, ignoring everything known about late prehistoric Arabia, were convinced that these regions were empty until fairly recent times. But the multiplication of discoveries quickly led them to abandon such unbalanced interpretations and to recognise in the sites the dwellings of local fishermen engaged in trade with southern Mesopotamian villages from which they obtained these painted pots. Dozens of sites are known fig. from Kuwait (as-Sabiyah) to the Strait of Hormuz (Nad Al-Walid in the Emirate of Ra's Al-Khaimah). In most of them were found a few bones of domestic animals like cattle, sheep and goats that attest to their connections with the interior, while basic flint tools and weapons, such as small triangular barbed and stemmed arrowheads are also those found in the flint scatters left at temporary campsites in the interior, and which completely differ from what is found in the Ubaid villages of Mesopotamia. The people at some sites had even developed their own pottery, consisting mainly of bowls of rather coarse reddish ware with a polished surface or vessels made of white plaster with black painted decoration in imitation of the Ubaid type vessels, such as those found at Dalma.

Excavations at Khor on the northeastern coast of the Qatar peninsula suggest that, already in the 6th millennium BC, some fish catches were processed to be consumed elsewhere, in the interior or, possibly, in distant southern Mesopotamia. We have few indications of what was really exchanged across the Gulf network in these times, with the exception of bitumen that already, by the 5th millennium BC, had reached such places as Ayn as-Sayh near Dhahran or Umm Al-Qawayn, where a few bitumen beads were found at site UAQ-2 (fig. 38). We may suppose that other luxuries, like pearls, were sent to Mesopotamia and that some products of agriculture and domestic crafts came in return. Some authors have insisted on a community between the earlier populations of the Gulf and those of southern Mesopotamia and the Arabian coast, pushed away from the former plains and marshes of the Gulf by rising water. This may, for instance, explain why the land of Dilmun which, in the 3rd millennium BC, can be identified with the northern Gulf between Kuwait and Qatar, had a sacred character in Mesopotamian myths and was considered as the original paradise, "where the lion does not bite and the crow does not cry". Dilmun was also where king Gilgamesh, the mythical hero of the oldest Sumerian epics, went to dive in order to win the "flower of immortality", and was the residence given by the

gods to Uta Napishtim, the Mesopotamian Noah, once he had managed to save mankind from the Deluge by building a huge bitumen-coated reed boat. This, however, is not the place to speculate further on such debatable issues.

Apart from these obvious Mesopotamian contacts, archaeological prospecting along the Arabian coast of the Gulf suggests another possible connection that may have been of some importance. Several types of flint points found in Qatar, and dated to around the 7th millennium BC, are for the first time in the region made of flint blades and not of flakes (fig. 37). They display evident similarities with materials from the first part of the 7th millennium BC, known in the Levant and northern Mesopotamia as PPNB (pre-pottery Neolithic B). This was a period of an already fully-developed pastoral and agricultural economy, with permanent villages, whose culture is known to have influenced the desert margins. Around 7000 BC, the nomadic groups of southern Jordan and northern Saudi Arabia had adopted animal husbandry (mainly goats) and sporadic cultivation of cereals (barley). The presence of these flint items along the Gulf may be an indication that these contacts had also, at least sporadically, touched this area, and some authors suggest that domestic animals like sheep and goats came in through this route. The inhabitants of these PPNB villages possessed an extraordinary mastery of plaster, from which they made vessels or moulded the skulls of dead ancestors, and even made almost life-size statues, like those found at Aïn Ghazal in Jordan. One may conjecture that the plaster vessels of Dalma are in some way a distant offspring of these contacts.

Research has been mainly focussed on coastal areas, where sites largely consisting of shells are easy to find, even if, as we have seen, they constitute a truncated archaeological record because the earlier periods are missing. Surveys in the interior have yielded many sites, but unfortunately those totally reduced by erosion to scatters of flint tools at the edge of fossil lakes between sand dunes, like those found during the large scientific project carried out in the Sharqiyah sands during the mid 1980s. We have long lacked stratified sites where other evidence like bones, vegetal fragments or structural remains would be associated with the tools and allow us a better understanding of the local way of life. It is one thing to suppose that arrowheads indicate the presence of hunters, quite another to know from their bones what animals were hunted, how and in which season, or to find that in the same places domestic animals were also present. This situation conveys the impression that until very late only small bands of hunters roamed the desert and its margins, that were still greener than now and populated by wild herds until the late 6th millennium BC. It has been known for some time, however, that domestic animals, cattle and goats, were present around that date at Aïn Qannas in the Hasa oasis in Saudi Arabia and at the contemporaneous site of Dosiriyah on the coast. This picture is now rapidly changing with the discovery of al-Buhais 18 in the Emirate of Sharjah at the piedmont between the desert and the Omani mountains. This stratified site, dated by radiocarbon to the first half of the 5th millennium BC, was found by chance a few years ago while investigators were studying the scanty remains of a later 3rd millennium site. It yielded the circular huts and cemetery of a community which mainly relied for its subsistence on the herding of cattle, sheep and goats (see window 3). Steppe mammals such as gazelles, wild asses and camels were still occasionally hunted but played a minor dietary role. Further studies have demonstrated that the site was mainly used in spring, by people who moved every year between the sea, where they spent autumn and winter fishing and collecting shell-fish, probably in the area between Dubai and Umm Al-Qawayn, and the mountains, where they spent summer, in places that are still to be found. Such a pattern may also be suggested for Aïn Qannas and coastal sites near Dhahran in Saudi Arabia, explaining the presence of Ubaid type pottery far inland. Most of the ornaments accompanying the deceased in the burials of Al-Buhais 18 are made of shell, like those of individuals found in the coastal site UAQ-2 at Umm Al-Qawayn (fig. 35).

It can, therefore, be suggested that by 5000 BC forager groups had turned to a complex way of life,

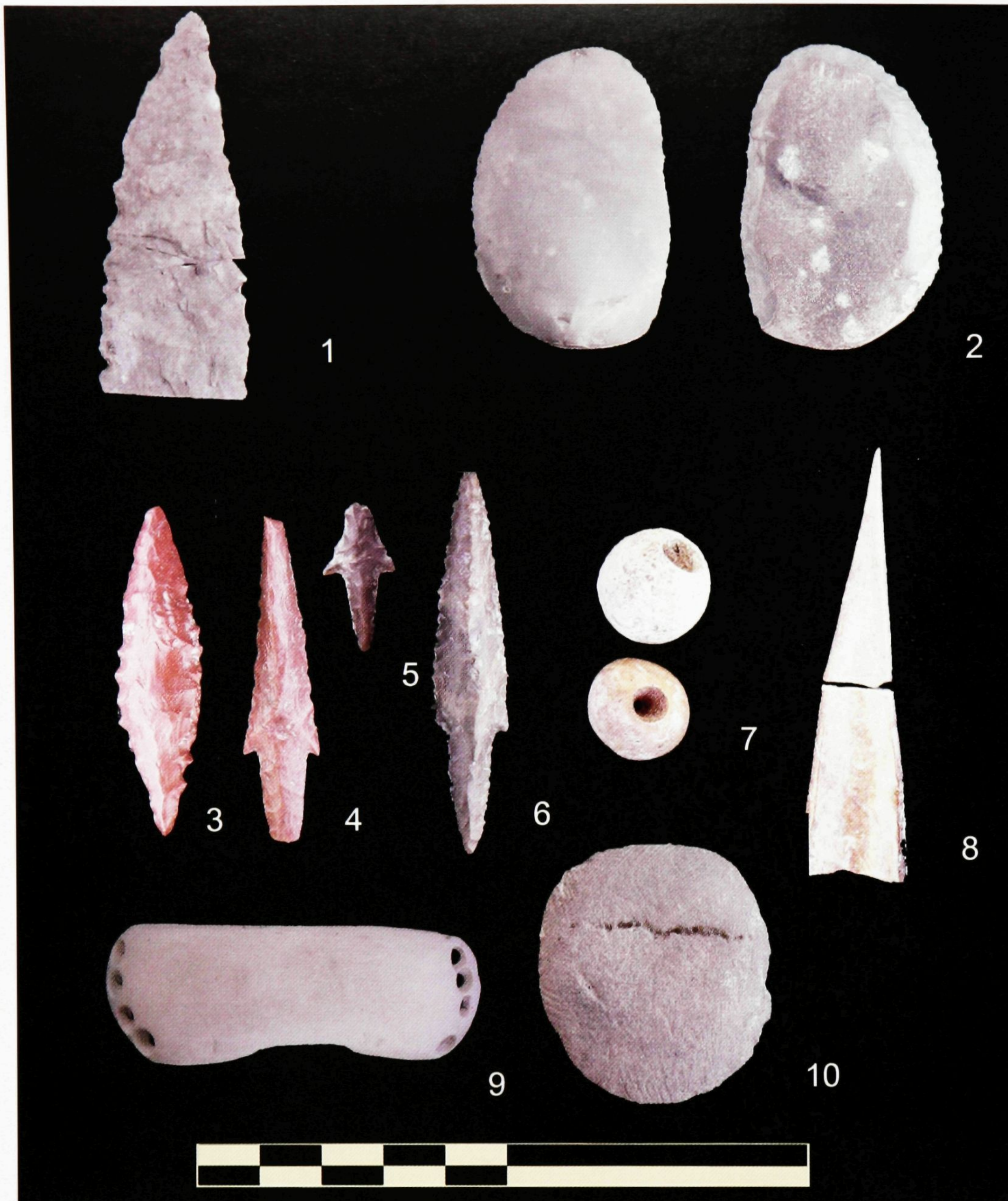


Figure 41:
Flint tools (1-2), flint arrowheads (3-6), two perforated pearls (7), bone point (8), a shell ornament (9) and engraved pebble (10), a characteristic assemblage of 6th-5th millennium BC at as-Suwayh SWY-1 (photo Joint Hadd Project).

adding animal husbandry to the natural resources they used to exploit in their yearly movements between coast and interior. There are very few clues to suggest a local and independent domestication, as the wild ancestors of these early herds were probably not present in Oman, and this adoption is very probably linked to the contacts mentioned above rather than, as has sometimes been proposed, to the arrival of new immigrants. The beginning of animal husbandry may be considered as a response of Early Holocene foragers to the depletion of big game herds after a few millennia of intensive hunting. As a matter of fact, bones of domestic animals have been found in many places, even in the desert areas of the Western Rub' Al-Khali such as at Jiledah or Al-Mutabthat, and it may be that herding came in to supplement a decreasingly rewarding hunting economy before it fully replaced it. Late prehistoric hunting and foraging bands, when they adopted animal husbandry, were probably exploiting for many generations a restricted territory with multivarious resources, moving with a repetitive rhythm along the wadi beds and steppes between hills and seashore lagoons or between highlands and deserts. Such territories were less restricted and affected by human behaviour than those of the farmers of the Fertile Crescent. They may even have been partly shared with other groups, but the communities who used them can already be considered to some extent as land-holders. The foundation of their evolution up to

historical times became rooted in the consolidation of an identity strongly determined by the intersection of abstract bonds among the people and their concrete relationship to a land where marks of this possession were constantly left.

Foragers in the sea

The situation along the Arabian Sea coast was very different from what has been described in the Gulf. The continental shelf there is very narrow and the mangrove and swamp areas, although they existed at the mouths of wadis, never reached the extent that can be reconstructed for the Gulf. On the other hand, the deep valleys of the high mountains were certainly a very favourable environment for foraging communities during the wetter period of the Early Holocene. As in the Gulf, all the earliest sites are under water, or deeply buried below the sediment that filled the valleys during the rise in ocean levels. Landscapes changed many times and human communities often moved to maintain their way of life. Barriers and keep nets could be used at the mouth of wadis, although to a much lesser extent than in the large flat areas of the Gulf. We will see in the next chapter that by the beginning of the 4th millennium BC the settlements of the Arabian Sea coast displayed all the evidence of a new and revolutionary adaptation that took place in very few areas across the globe: deep sea fishing.

This is an extremely difficult and controversial question. We have already mentioned that, some 60,000 years ago, men somehow crossed the Strait of Flores, whose depth they could not even imagine, to reach the Australian continent, a land they could never have seen before. Many specialists would also agree that short navigations across the Bab Al-Mandab Strait explain the origins of human presence in southern Arabia. One can speculate endlessly on the origins of high seas ventures with little possibility of grounding such speculation in actual facts as almost all coastal sites from between 100,000 and 7000 years ago are below present sea levels. We must simply accept that modern humans dreaming of a better world were quite early on capable of assembling floating devices and skilled enough to brave unknown waters, even if many of them never reached the other shore. The relevant question is in fact another one. These trips without hope of a return are different from regular ocean ventures to extract food for daily subsistence. Many coastal populations globally live by the sea without routinely venturing far from the shoreline. But coastal Omanis did venture out and it would be extremely interesting to understand how and when. To answer this question we have two options. Either they did it before - maybe long before - the ocean reached its present level, in which case we cannot tell anything from the archaeological information available to us, or they did it later. We will now examine this latter option.

The earliest sites known along the Arabian Sea coast, like HD-6 at Ra's Al-Hamra or SWY-1 and SWY-11 at as-Suwayh in the Ja'alan, were settled towards the end of the 6th millennium BC (fig. 40). This is more or less the time when present-day sea levels were first reached. We may of course confidently assume that earlier coastal sites existed, but are now flooded and destroyed by the sea and beyond reach of archaeological research. The most informative one at present is certainly RH-6 at Ra's Al-Hamra. It was located on the eastern edge of the Qurum mangrove at some distance from the sea. Detailed study of the finds here show that the mangrove biomass was fully exploited, as demonstrated by the type of shells found in the deposit - mainly mangrove oysters and *Terebralia palustris*. Mangrove wood was also widely collected and used. Fish mostly comprised species that live in the mangroves or come in from the sea, to be easily trapped by various kinds of more or less fixed devices like barriers and keep nets. There were also those that can be caught from the shore with lines and throw nets. None of the commonly found species suggests that it was necessary to risk human life in deep waters. On all these points RH-6 does not differ from coastal sites as they are known in the Gulf. It was a winter station in the yearly cycle of the community's movement between mountains and sea. The savannah-like parklands surrounding the mangrove were also exploited through hunting, and some domestic animals were possibly already kept. Sites SWY-1 and 11 in the Ja'alan are located in a

similar situation, on a sandbar between the open sea and a lagoon, and the preliminary study of shells and fish bones present in the oldest layers of SWY-1 indicates that the lagoon and the seashore were the main environments exploited for food. All this would suggest that, by 5000 BC, the fishing communities along the Arabian Sea were still mainly relying on lagoons and the seashore for their daily subsistence and did not regularly venture onto the high seas (fig. 41).

This would of course have required boats, and boats in themselves were nothing new. We already know about bitumen-coated reed boats in the Gulf, from the earliest known sites around 5200 BC at as-Sabiyah in Kuwait. That such craft are witnessed for the first time in the Arabian Sea around 3400 BC (see our next chapter) suggests that such a technology was also available to the early fishing communities there. But navigation in the Gulf was mainly a development of navigation in the calm waters of the marshes and rivers, and poles may have been as useful as sails, with shallow waters as a major hazard. It was a completely different task to develop the know-how for navigating ever further away from land, to use dangerous winds and currents, to face larger waves, and still be able to return safely home. This was done at the risk of many lives (but we should not forget that hunting large mammals was also dangerous) in the hope of catching fish among the large shoals that could be seen from the cliffs rather than taking a marginal share from the shoreline. It meant mastering a new environment with its many hazards and benefits, economic and social. We may imagine that intrepid sailors could acquire a social prestige comparable to that of the best hunters.

As it had been for hunting, much new knowledge had to be developed beyond technology, and this has left almost no archaeological trace. A coherent array of signs rather than actual facts suggests that this knowledge was progressively built up during the 5th millennium BC. Most conspicuous, perhaps, is the appearance of new types of fishing tools towards the end of the 5th millennium BC that remained in use for almost a millennium, i.e. until the times when open sea fishing was undoubtedly a regular activity. These include new types of net-sinkers and a large variety of shell hooks of different sizes (from 3 to almost 10 cm) and shapes, with a more or less open hook and notches or holes to fix the hook to the line. Some of these hooks are clearly aimed at catching large fish species like tuna, while the variety in size of net sinkers also suggests a diversification of fishing tools and methods. If we compare all this with the Gulf sites, the fishing equipment found along the Arabian Sea coast appears for the first time to be very different and much more sophisticated, and this may be related to the fact that new waters were being exploited in boats sailing further away from the coastline.

The wide body of deep water opening from the Strait of Hormuz towards Pakistan and India, on the one hand, and towards southern Arabia and the Horn of Africa, on the other, was probably only very marginally tackled by the coastal populations of Oman in the 5th millennium BC. This would take many more generations. Boats disappeared and innumerable intrepid sailors drowned before its rich fish resources could be appropriately exploited. It was even longer before overseas trade could be carried out using the monsoons. This seems evident from the 3rd millennium BC, but by the end of the 5th millennium BC the practice was well under way. ❑

Window 3
Early Herders at Al-Buhais 18
By Margerethe and Hans-Peter Uerpmann

Al-Buhais is a locality in the interior of the Emirate of Sharjah (UAE) not far from the Omani border. While exploring Bronze Age graves in that area, the archaeological team of the Directorate of Antiquities in the Department of Culture and Information of the Government of Sharjah, led by Dr Sabah A. Jasim, found a place which belonged to a much earlier phase. Site no. 18 turned out to be a Neolithic graveyard with related settlement features. The graveyard contained the skeletal remains of more than 450 individuals. A stone midden nearby consisted of fire-cracked cobblestones used as heating and cooking stones in the roasting pits found inside the midden and – less dense – all over the surrounding plain. More than 20 radiocarbon dates obtained from the ashes found in these pits cluster between about 5200 BC and 4000 BC. The stone midden preserved numerous fragments of animal bones, which were the left-overs of meals cooked in the roasting pits. These remains provide an insight into a particular segment of the subsistence economy of the people who buried their dead at the foot of Jebel Al-Buhais.

Quantified by bone-weight, almost 90% of the bones were of domestic animals. In terms of fragment numbers, the domesticated variety even reached 95% of 7520 identified bones. Hunted animals contributed about 11% of the meat eaten at Al-Buhais 18. Among them were oryx (Oryx leucoryx) and gazelle (probably Gazella gazella) as typical desert dwellers, but more important were the wild ass (Equus africanus) and the wild ancestor of the dromedary (Camelus dromedarius). Whether the remains of a wild goat belong to the Nubian ibex (Capra nubiana) or to the ancestral form of the domestic goat (Capra aegragus) could not be determined with certainty. Among the domesticates, cattle provided a good quarter of the meat eaten at the site. The rest came from sheep and goats with the sheep being slightly more abundant than the goats.

However, these figures only represent what this population ate during its stay at Al-Buhais. There is evidence for seasonal movement. The bone remains of sheep and goats indicate that almost no young animals were slaughtered at the site. This is very unusual because the reproduction of domestic herds requires substantial culling of young animals in order to keep herd sizes in balance with available pasture. Culling usually happens in late summer and autumn – a time when the occupants of Al-Buhais obviously had moved on to other areas. There is good evidence that these people spent some time of



Figure 42: Al-Buhais 18: a collective burial with at least 5 individuals. It is unclear whether they were deposited simultaneously or successively (photo M. & H.-P. Uerpmann).



Figure 43:
Al-Buhais 18: a secondary burial containing only the skull and the long bones of four individuals.

the year on the coast. Most of their adornments are made of shell, mother of pearl, and pearls themselves. However, the coastal shell middens dating to this period also lack the remains of numerous young sheep and goats. Usually few bones of domestic or wild mammals are found at these sites. It is most likely that the early shell middens were mainly occupied during winter. Subsistence was then primarily based on fishing and shellfish gathering. In early spring – in the lambing and calving season of their herds – they moved into the foot-plains of the Hajar mountains, where Al-Buhais is located. The lush pastures there may have provided an opportunity for larger groups of herders to congregate for social reasons – like festivities and burial rituals. The graveyard of Al-Buhais also contains many secondary burials, indicating that the skeletal remains of those who died far away were brought back to this "central place" (fig. 42). Later, during their yearly cycle, these early nomads may have split into smaller groups searching for pasture and relief from summer heat in the higher parts of the Hajar mountains – where their sites still remain to be found by future research (fig. 43).

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Uerpmann, M., Uerpmann, H.-P. & Jasim, S. A. (2000): Stone Age nomadism in SE-Arabia - palaeo-economic considerations on the Neolithic site of Al-Buhais 18 in the Emirate of Sharjah, U.A.E. Proceedings of the Seminar for Arabian Studies 30, 229-234. ❑

Chapter 4

The Great Transformation

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The Great Transformation

The cultural and political transformations of the 4th millennium BC moved the Middle East ahead of every other region in the world. The most remarkable, and by far the most revolutionary, achievement was the foundation of the earliest states in southern Mesopotamia and, a few generations later, almost everywhere between the Nile and the Indus. A corollary to the establishment of the first states was the emergence of writing, invented around 3400 BC as an indispensable tool for recording transactions, ratios, deeds, tributes to rulers, and distribution among the people of various types of goods by different agencies. By the end of the 4th millennium BC, local communities in Oman also experienced deep though different transformations. We call this episode the Great Transformation as an echo of the term used by a major economist of the 20th century, Karl Polanyi, when he referred to the drastic social changes induced by the definitive advent of a market economy in Great Britain during the earliest decades of the 19th century. This of course does not mean that we draw a parallel between these two processes. It simply means that in both cases life would never be the same again.

Towards early states

Since the days of the hunters and foragers at the beginning of the Holocene, around 8500 BC, people's lives in most of the Middle East had often changed, redirected every few generations by constant improvements and innovations. By 4000 BC these innovations had already been firmly established for hundreds if not thousands of years over a vast region of the Old World. Agriculture, the first and most conspicuous of all inventions developed from plants and animals domesticated during the Early Holocene, created food and economy throughout the whole Mediterranean region, from India to the Atlantic. At that time agriculture was also rapidly penetrating into Africa and the Eurasian landmass. The main industrial by-products of farming and stock-breeding were textiles, spun and woven from wool and a number of different plant fibres; these had become established in every family as a manufacturing activity, across villages and campsites alike. Pottery was the standard container, produced at village level since the seventh millennium BC, daily used and broken in every household. Metals had also come into common use about a millennium after pottery, and in the core areas of trade with higher population densities they were rapidly taking the place of flint for the making of tools. The economy of production was a dynamic reality from 5000 BC. Wealth was slowly but steadily accumulated by efficient exchange networks operating by land and sea from Egypt down to Oman and up to the highlands of Anatolia and the outskirts of Central Asia in southern Turkmenistan.

Landscapes and the natural environment had also been transformed to respond to the new needs of the human population. At the beginning of the 4th millennium BC, many wild plants and animals, whether harmful or useless, had been removed to make way for farmland and pastures. Still, we ought to recognise that among all these transformations from the age of the hunters much less had changed for the people themselves. It was as if the whole world had to come apart before the structure and form of human relationships could be transformed. The clans or lineage groups, bound by real or presumed consanguineous relations in family groups mostly arranged by patrilineal descent, were still the dominant factor of power, harnessing labour and organising the distribution of land and resources. Whatever latent innovation might have smouldered below the surface, power still lay with the ancestors, and in every community those closest to them, the elders, ran everybody's life.

Archaeological surveys in all countries of the Middle East have made it possible to establish the distribution of populations during prehistoric times by mapping ancient settlement systems. With a few exceptions, mostly evident in the lowlands of Mesopotamia (nowadays split between Iran and Iraq), all farming territories in the core regions of the

Middle East were still organised around 4000 BC according to spatial cells of 5-600 square kilometres, occupied by villages and farmhouses with minimal hierarchical divisions. The largest settlements rarely extended more than 10 hectares, contained about 1000 people, and bore little evidence of political centrality. This means that, apart from kinship, there was no established central power to draw people or tribute from the satellite populations. Chiefs from hegemonic lineage had already been in place since at least the establishment of agriculture in Neolithic times, but their leadership was more ritual than real compared with other family elders'. It resembled what the English very appropriately call "peer-polity", adjusting the Latin expression primus inter pares, "first among equals", to describe the crisis of Medieval royalty that compelled the Plantagenet King John "Landless" to sign the *Magna Charta* in 1214 AD. Recalling the legends written in those times, but still loved nowadays through endless re-visitations by Hollywood, it was all like Camelot, Arthur, the Round Table and the King to come. In the Assyrian myth on the origins of dynasties, one of the first kings is named *Kullusina bêl*: "they all were Lords".

The upheaval for that small world of peaceful villages between Anatolia and Afghanistan came during the first half of the 4th millennium BC. Like a landslide falling with increasing speed and roar, changes developed within the societies of affluent farmers living in the most fertile lands of Mesopotamia, Syria and the Iranian Plateau - places that had already developed the largest central settlements and the highest population densities. One of the most reliable theories is that the birth of the first states was nursed by litigation, local conflicts and the increasing expectations of family leaders as a mean of solving crises and further expanding the economic base by enhancing the availability of labour and resources. In fact these changes did not concern any of the physical aspects of economy since society was transformed by the re-organisation of human relations in radically different political structures. However, in Mesopotamia, as in any other agricultural society of the world, the early states are immediately notable in the archaeological record for the rapid growth of central towns alongside all other settlements in the territory they control. But this is not the only evidence, given that physical expansion is not just the result of an increasing number of people moving into towns. New functions were created. Temples, courts, offices, markets and storage facilities, waterworks and tanks, barracks and defence works, factories and workshops - these all required special buildings and activity areas in addition to residential quarters in order to drive the new centripetal physics of stratified power. This multiplication of functions and life-long jobs generated the embryos of future cities. There have been states without cities, as the invincible armies of Gengiz Khan proved to the world, but there are no cities without a state. The state might contain a single city and little land around it, and we know that in the second half of the 4th millennium BC the earliest states emerging across the Mesopotamian lowlands had enough resources and people to feed the pristine urban growth within territories on average not larger than about 1000 square kilometres. This was also the size of quite a few states in Ancient Greece and Medieval Italy, but to call them "city-states", as was customary until a few years ago, is relatively meaningless in historical terms. The relevant fact is that they were states - hierarchical political structures organised for the exploitation of resources and the accumulation of wealth. Since the mother of all resources and the source of all wealth is human labour, the cumulative effect of its physical re-organisation was the establishment of central places to house the craftsmen and the institutions that controlled the main production cycles, i.e. the towns.

Although the first "seeds of upheaval" that caused the emergence of states were detected at Susa and other centres in the Mesopotamian lowlands and dated to around 4000 BC, it was not until 3400 BC that the new hierarchical societies generated the first towns. Uruk, Eridu, Ur, Kish, Lagash, Susa are the names of the earliest centres, known from the epics and confirmed by archaeologists, while many more still await the spade as mounds of clay standing in the alluvial plains at the head of the Gulf. Here the silt from distant mountains created a

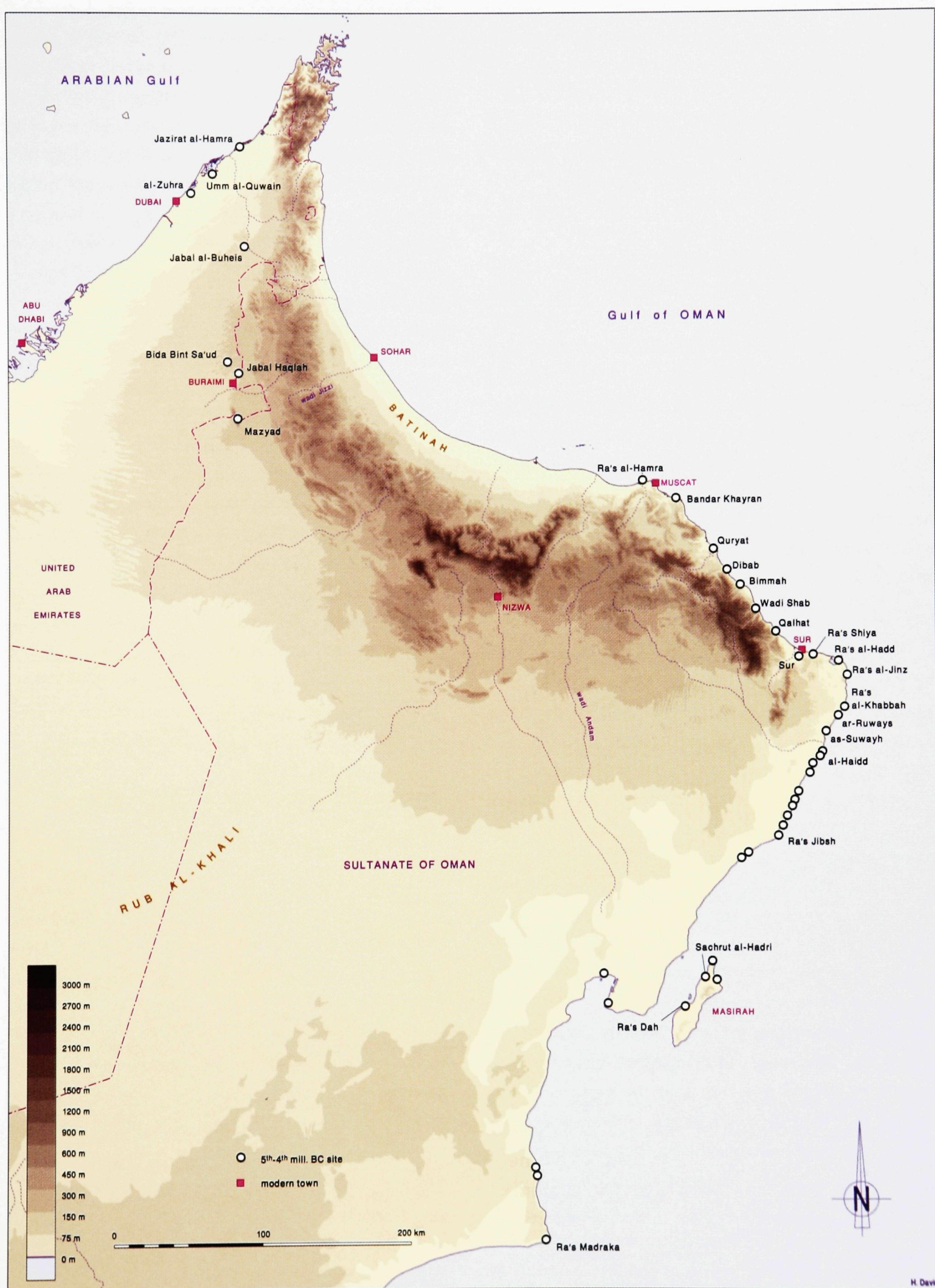


Figure 44 – Map of 6th-4th millennium sites located in Oman. Their distribution indicates the intensity of research in various areas rather than actual distribution. The interior almost completely lacks surveys although it is known that many sites are present, while only sections of the coast have been surveyed. (drawing Hélène David).

land of plenty that nourished legendary memories of the genesis of mankind and civilisation.

Where does Oman fit into this picture of growth and revolutionary change? We would say totally outside it, because most of the Arabian peninsula moved along a different evolutionary pathway. By the end of the Early Holocene, around 5000 BC, agriculture and food production were still a very marginal activity, strictly limited along the desert borders of the Syro-Palestinian temperate belt, while subsistence was still based on hunting and foraging. However, this does not mean that the emergence of early states during the 4th millennium BC had no impact on the development of Arabia. On the contrary, the new political systems developing in Mesopotamia and Iran acted as catalysts, stimulating the selective transformation of traditional Arabian subsistence activities into exchange economies, efficiently articulated to their supply circuits.

The architecture of hierarchy as pyramids of vertical divisions of power and wealth was one way primeval bands could control land, people and resources. Once agriculture had become the adaptive pathway taken by foragers at the end of the Pleistocene, there were almost no alternatives to the rigid vertical and horizontal divisions of hierarchy that eventually rose to form the early states after millennia of accumulation. The storage of food reserves over months after the harvest and a strict division of labour were conditions for living on the land, and the land, as our grandparents knew very well, demands attention, energy and discipline almost every day of the year. Farmers are the least free people among humans and this may be why there are so few left in the most developed countries. The process is a simple one. As soon as more families come together for longer periods in extensive bands, leadership becomes a critical issue because different families mean different lineages and different lineages mean different ancestors. The elders can no longer be the natural leaders of their people: the new aggregation demands a political leader. Sooner or later, more or less consensually, leaders become chiefs, at first temporary, but soon permanent. Once the roles become hereditary, they become rulers and power is established above the ancestors of others. One family, one clan, rules everyone and the game is over. Obviously, at any moment others might disagree and opposing minorities might leave to continue their way of life, or the majority might destroy the leader's power. In order to avoid vertical divisions of power, an alternative option was to keep equality among allied families without renouncing any aspect of property and control, stressing similarity instead of difference. These egalitarian societies have become known among historians as "tribes", and in the early days of cultural anthropology, they were considered a primitive form of society, as opposed to civilisation identified with the city and state. Ultimately, it was used as a derogatory term that simplistically lumped together a wide variety of social formations belonging to distant times and places. We know very well that tribes ruled vast territories across the steppes of Eurasia, in Africa, and in the Americas, where millions of people lived accumulating enormous wealth and military power. To quote just one example, the empire of Gingiz Khan possessed a tribal architecture. The great conqueror was no king when he died and the new emperor had to be elected by the Kuraltay, which was nothing else than the congress of family elders representing the Mongol nation.

This was also the way the Arabs took.

Among the foraging societies of Oman, the role of agriculture must have remained marginal until the Early Bronze Age, and the way seems to have been opened for different choices. Our present knowledge of the situation in the interior is unfortunately extremely poor, while on the Arabian Sea coast, from Muscat to Ra's Madrakah, evidence from dozens of settlements allows us to establish a remarkable level of cultural integration around 4000 BC (fig. 44). From Muscat (Ra's Al-Hamra) to Quriyat (Khor Milh), Tiwi (Wadi Shab), Sur, Ra's Al-Hadd, Ra's Al-Jinz, Suwayh and along the coast south of Al-Ashkarah, these settlements allow us to suggest a very different story. Beyond uniformity in material culture, one can rebuild a system where independent local groups, including different lineag-

es, combined for the control of a territory and its resources. The basic social entity was the nuclear family with its members sharing the same living quarters. Different nuclear families lived and moved together between seasonal campsites. The archaeological evidence indicates that each local group included from four to ten households, and if we reckon between five and ten as the size of a nuclear family, adults and children together, the total of a group holding a territory would have been between twenty and a hundred people, and most probably between thirty and sixty. The question at this point is how big was the territory controlled by a local group. This calculation can be done only after intensive surveys across areas where sites are visible, as for example along the arid coast of Oman, where foragers were segmented along the shores of lagoons or the ocean. In general, the distance between sites is between three and five kilometres. These composite descent groups were the main actors on the ecological scene, organising resource exploitation over the year according to the different territorial compartments they controlled.

From ethnological studies of island foragers in the Indian Ocean, like the Onge of the Andaman Islands, we may understand how the mosaic of these composite descent groups operated together, providing a first definition of a "tribe". Tribes were merely a collection of independent local groups that spoke the same language, shared a common culture and ideological traditions, and were bound to each other by friendship or enmity. There might have been a ceremonial centre, or an enshrined feature in the landscape like the Australian songlines, where people gathered for festivals to confirm their bonds of alliance by exchanging women and goods, meanwhile resolving conflicts and disputes that had arisen during the year. Usually there was no tribal territory as such, only a number of hunting areas, each corresponding to a local group. Groups moved during the year between two main seasonal campsites, radiating from each of them across the landscape in hunting parties and food gathering groups of women and children. These kinds of social formations are not tribes in the sense the word is normally understood in historical literature to define the social conditions of modern people like the Arabs or the Germans as they fought the Romans. The groups living in Oman during most of the Middle Holocene, like the modern Onge or the Mbuti of Congo, would have had no power structure involving chiefs, no tribally-owned territories, no clans, and maybe not even much in the way of worshipped common tribal ancestors. Indeed, as one brilliant anthropologist has written with reference to the Onge, "it is easier to define these tribes by what they are not, rather than by what they are".

Since prehistory this abstract architecture of family relations has shaped the social and political life in the mosaic of different ecological conditions dominated by extreme aridity that characterises Arabia. In Ibn Khaldun's view, "The desert is a place of hardship and starvation", but to the Bedu, the truest Arabs according to him, "it has become familiar and accustomed. "Generations of Bedouins grew up in the desert ... their defence and protection are successful ... [because] they are a closely knit group of common descent ... Clearly the Bedouins are closer to being good than sedentary people" (*Al-Muqaddimah*, chapter 2, 4-7). This pattern has turned out to be far more solid and pervasive that any pyramid of hierarchies and power, and it has survived through time and change better than the strongest empires, including that built by the successors of the Prophet. The fact is that Arab civilisation has been greater and longer lasting than the empire of the first Caliphs. One reason is that its roots are far older and deeper since they may be traced back to prehistory. Archaeology is proving the continuity of Arabian civilisation and the important role of Oman in its early formation.

A Long Prelude Ends

A most striking aspect of Oman's prehistory is the persistence of what remained in many aspects a Stone Age subsistence economy until the end of the Middle Holocene, while for some three millennia the world all around had consolidated the structures of a productive economy, including Iran and Makran just across the sea. By 3400 BC coastal settlements such as RH-5 at Qurum, GAS-1 at the mouth of Wadi Shab, and SWY-2 at Suwayh in the Ja'alan

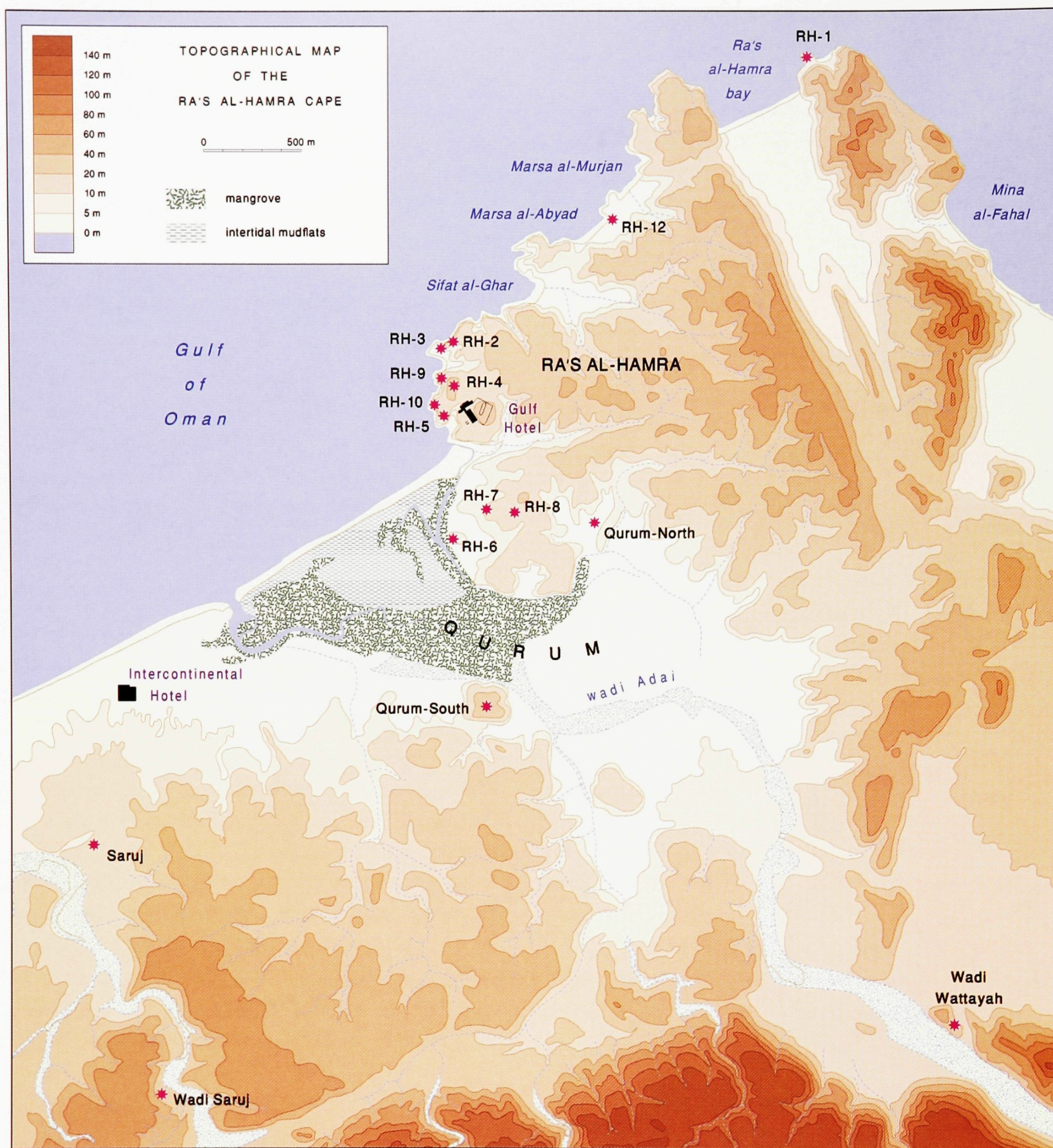


Figure 45:
The Middle Holocene sites at the mouth of Wadi Aday. Prehistoric men occupied every type of environment between river and sea to exploit the diversified biomass that flourished between salt and sweet water. The intensive development of the area, one of the most exclusive in the Capital, has destroyed most of them, although a rich documentation was recovered by archaeologists during the eighties, and two sites, RH-6 and part of RH-5, are now protected (drawing by Hélène David).



Figure 46:
Ra's Al-Hamra site RH-5 (4th millennium BC) under excavation in the early eighties during the beginning of urban development (photo Italian Archaeological Mission to Oman).

exhibited a material culture that still required no specialised sectors for exchange production. Neither pottery nor metal was manufactured, although the discovery of Ubaid potsherds at almost all Middle Holocene sites along the western shores of the Oman peninsula indicates that pottery had been known in the region at least since the end of the 6th millennium BC, though it was not integrated into currently used technologies until the Early Bronze Age. Almost all tools and ornaments were made from local shells and stones, and even the beads and pendants found in burial sites were still produced locally by the same families at a household level. The repetitive distribution in each excavated house unit of manufacturing waste has confirmed the lack of any craft specialisation.

After ca. 5000 BC, the dramatic rise in sea level following the end of the last glaciation had reached the present one, and for the next three millennia it was to fluctuate ca. 2-3 metres above. Lagoons with mangrove swamps were still more developed than now, occurring in places where they no longer exist such as on the eastern coast of Ja'alan south of Ra's al-Jinz. But the study of pollens recovered from core drillings in these mangroves has disclosed another item of important information: they were significantly different from before. The *Rhizophora* trees that were present in large numbers had disappeared, and only the *Avicennia* that still characterise the modern mangroves were found. *Rhizophora* only occur in the more humid areas still touched by the monsoon, like contempoary Dhofar where they can still be found in the khawrs east and west of Salalah. This is an indication that the Holocene wet phase was definitely over and that the climate had turned significantly dryer, with almost no summer rains, as confirmed by the appearance in the same core samples of pollens of *Prosopis cineraria*, the Arabic *Ghaf*, that characterises the desert margins. These elements complement the more general climatic models that, from various types of data, all indicate the rapid coming of an aridity similar to the present. Such changes resulted from the swift withdrawal to the south of the northernmost latitudes reached by the monsoon during the very first centuries of the 4th millennium BC. It obviously induced changes in vegetation and the animal population that it could sustain. The savannah-like cover of the sedimentary terraces in the interior of the Ja'alan disappeared; the soil was eroded and the area became the barren stony zone that it is now. Archaeologists have long been tempted to link such drastic natural changes with the reduction or even disappearance of prehistoric populations. But the archaeological record tells us exactly the contrary: we have never before found so many sites as those dating from the 4th millennium BC. More than one hundred have been identified



Figure 47:
Ra's Al-Hamra site RH-5: postholes and storage pits of mid 4th millennium circular huts (photo Italian Archaeological Mission to Oman).

along the coast between the Capital Area and Dhofar, and there is no doubt that many more are still to be found, or have already been destroyed, notably along the Batinah coast. On the other hand, these many sites should probably not lead us to conclusions about the presence of a very large population. They were probably not settled at the same time by mobile groups of 30 to 60 people, continuing their previous way of life between sea and mountains according to a more or less regular yearly pattern. These groups could adapt to more increasingly arid conditions and one may even expect that the coastal areas, whose rich biomass was probably little affected by climatic change, acted as a kind of helpful buffer. The situation may have been more difficult in the interior but our information suffers from a major bias. We may be confident that many sites existed along the piedmonts and the mountain valleys, but we do not know at present of a single one, with the possible exception of circular stone houses at Lizq 2 in Wadi Samad that have not been excavated.



Figure 48:
Traditional huts in the highlands of Dhofar (after Scholtz, 1977).



Figure 49 - The "Swiss knife" of the Ra's Al-Hamra fishermen: a long gabbro pebble with different wear traces on its surface, indicating that it was used for various tasks in daily life (photo Italian Archaeological Mission to Oman).

For the time being, the mangrove and cliffs of Qurum in the Capital Area and the eastern Ja'alan from Sur to Al-Ashkarah are certainly the most informative regions. Some 40 sites are known from the Ja'alan, of which 7 have been tested and 4 excavated to a large extent. Once fully studied and interpreted, the information recovered will be extremely important for understanding how the local communities used their territory. But for now, the most relevant data originate from site RH-5 at Qurum, where a village and its cemetery have been excavated.

Today the Qurum Nature Reserve is one of the main resort facilities in the Capital Area of Oman. Qurum is the Arabic for 'mangrove' and here in fact is one of the remnant populations of Avicennia marina trees in northern Oman, growing in the brackish waters of the creek at the mouth of Wadi Aday (fig. 45). Along the coastlands of the entire Indo-Pacific region mangroves constitute one of the richest biotopes, where one almost always finds shell middens left by prehistoric people who exploited both sea and lagoons for their daily subsistence. Those of Qurum were explored by archaeologists



Figure 50: Ra's Al-Hamra site RH-5: decorated shell leaf-shaped pendants from the necklace of a young woman in grave 05/06 (photo Italian Archaeological Mission to Oman).



Figure 51:
Ra's Al-Hamra site RH-5: another type of decorated shell pendant (photo Italian Archaeological Mission to Oman).



Figure 52:
Ra's Al-Hamra site RH-5: decorated shell pendants with central leaf-shaped holes (photo Italian Archaeological Mission to Oman).

during the eighties, before this part of the city was totally developed. One of the sites was very extensively exposed, and the excavations brought to light the remains of both dwellings and graves. Years of study by a team of archaeologists and other specialists have allowed us to reconstruct for the first time the seasonal settlement of an Omani fishing community and its way of life around the middle of the 4th millennium BC (fig. 46).

A Fishing Encampment at Ra's Al-Hamra

RH-5 is the tag name given by archaeologists to the low shell midden that almost entirely covered the surface of a flat headland overlooking the khawr and mangrove thickets at the mouth of Wadi Aday and marking the westernmost point of the Ra's Al-Hamra limestone formation (fig. 46). This is the frontier where the sandy stretches of the Batinah coast terminate and the saw-like carving of rocky cliffs begins. In this strategic location the site granted a group of human foragers control over the broadest spectrum of resources. Almost all the ecotypes existing along the coastlands of Oman were present here at a very short distance from the house door and hardly more than an hour's walk away. Sandy beaches, mangrove swamps, rocky cliffs, open Acacia parklands, riparian thickets of tamarisk and acacia winding like gigantic snakes along the watercourses cutting through open parklands and piedmont plains, hill slopes and terrace plateaux - they all merged



Figure 53:
Leach-shaped earrings, often decorated, are found on most 4th millennium sites in Oman. Their use as earrings is demonstrated by their position near the skull of the young woman in grave G.83. The examples presented here originate from Ra's Al-Hamra RH-5, Wadi Shab GAS-1 and as-Suwayh SWY-2 (photos and drawings Italian Archaeological Mission to Oman and Joint Hadd Project).

there, radiating from the headland and clearly visible to those who stood at the edge of the cliff 15-20 meters above the water line.

The fishing grounds opening from the other side of the headland were an even more plentiful source of food. Fahal Island, the barren rock rising from the water just two miles in front of Ra's Al-Hamra, marks the other end of a narrow point of the continental shelf that forces the passage of phytoplankton and the sardines feeding on it. When the sardines arrive during the winter months they move in waves like armies of ants and blacken the sea. Schools of other fish feed on them, only to be chased in turn by larger species along different trophic chains topped by whales, dolphins and, above all, fishermen waiting on the cape.

Hardly anything was lacking near Ra's Al-Hamra to meet the requirements of the prehistoric group for food and materials, including not only animals and plants of all kinds but also the stones they worked for tools and ornaments. Whatever the archaeologists have recovered from the remains of houses and graves can be procured nearby. Women and children could gather plants, molluscs, crabs and small animals, walking for a few hours daily with a dinky bag strapped to their shoulder, Australian Aborigine style, while parties of men went to hunt or fish, according to weather or inclination.

Hunting gazelle and to a less extent oryx on the plains, and thar or ibexes on the hills, was an activity pursued by small parties of men, but probably more for fun, training and social prestige than for their actual subsistence needs, at least during the time of the year when they lived at Qurum. Men were mostly engaged in fishing. Recovered bone remains suggest that the catch included a number of different species, ranging from small herrings and sardines about ten centimetres long to fish a metre in size and over ten kilograms in weight. Millions of small fish were caught using fine-meshed nets, whose stone weights made from notched pebbles of scaling size were the only indications left for the





Figure 54:
Possible early musical instruments of Oman. These two elongated flat objects nay be interpreted as rhombs, a well- known prehistoric item all over the world. When attached to a string and rotated in the air, it produces a loud roaring sound. In some tribes of the highlands of Papua-New Guinea (photo Joint Hadd Project).

archaeologist. Among other classes of fish, the second most frequent were within two to five kilograms and could be caught by net or shell-hooks whose fragmented remains were found in their hundreds during the excavations. The great majority of the larger fish caught and eaten were *Scombridae*, tuna and mackerel, and *Carangidae*, mainly jacks and pompanos. These fish still live in the Muscat area throughout the year. Larger species, like the sea bass, are more rare, as well as those living closer to the sea floor, such as porgies. Most daily nourishment from smaller fish was evidently collected by throw nets and more or less permanent fish traps by walking in shallow sea water or in the lagoon without need to sail offshore.

Also larger specimens could be caught by line-and-hook from the cliff's edge. Larger nets could be pulled directly from the beach as was customary in Oman and globally. However, there is no doubt that to catch on a regular basis those large and medium-size tunas required boats. From the sheer number of Scombridae and shark bones we may confidently assume that the Qurum fishermen living at RH-5 had boats, much like those used in recent years. Certainly these were not *huri*, the traditional Omani dugout canoe used everywhere along the coast and made from logs brought from India and East Africa, but boats of about the same size. The lack of large trees in Oman may suggest that they were built from reeds, stalks or small branches, like the shasha boats. The technique of lashing reed bundles together was probably known in the Middle East at least as early as the end of the Early Holocene. The Qurum fishermen had plenty of reeds available and could easily make either rafts or true hull boats like those already known a millennium earlier at Ayn as-Sayh on the Gulf coast of Saudi Arabia or at as-Sabiyah H3 in Kuwait, where they were associated with the Ubaid potsherds from Mesopotamia. In both these places the reed bundles were coated with bitumen, but there are no traces of this at RH-5 during the first half of the fourth millennium BC.



Figure 55 :
Ra's Al-Hamra site RH-5: this tomb excavated on an emergency basis during May 2005 is that of a young woman, less than 20 years old, who probably died while giving birth to twins. The second baby is still in her womb, while the first is deposited on her chest. Excavating such a dramatic event was not easy for Ms. Olivia Munoz, a woman physical anthropologist. Note the leaf- shaped pendants around her neck (see fig. 48) and the spherical pebble in the right hand over her head (photo Joint Hadd Project).

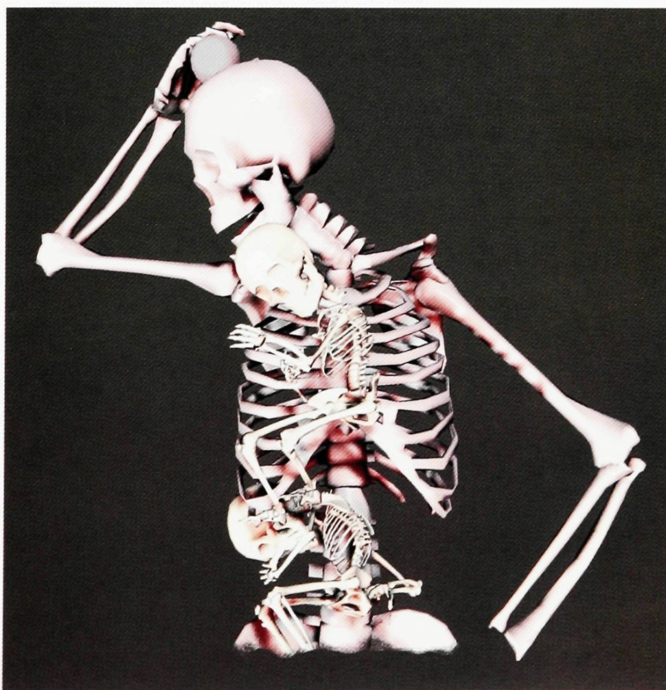


Figure 56 :
Ra's Al-Hamra site RH-5: a computer reconstruction of the same burial (Olivia Munoz, with software Poser™).

The sea provided not only fish for the diet of the few families living on the headland. The bone remains indicate that sea turtles also were frequently caught and eaten as well as different kinds of marine mammals like dolphins and porpoises. Some rare whale bones were also found, but it is more likely that these large animals were butchered when stranded on nearby beaches. Molluscs were also found everywhere, an easy catch for children crowding the shallow sands, the mangrove mud flats, and the tidal line along the rocky cliffs. Used daily as either food or bait, their shells have preserved prehistoric sites along the coasts of all the oceans of the world. It is hard to calculate what percentage of the diet at Qurum was made up of molluscs. A lot of them, like certain plants and small animals, were eaten as snacks at mid-day along the pathway of gathering parties. Probably only the evening meal was actually eaten indoors, leaving merely partial information for the archaeologist.

Quite evidently, then, sea and land were the natural larder of the Qurum foragers and provided them with plenty of options. After millennia of adaptive relations with the many different environments between desert and sea, people equally mastered



Figure 57:
Ra's Al-Hamra site RH-5: The skull of a man and the skull of a turtle placed against each other in grave G.41 (photo Italian Archaeological Mission to Oman).

every species on land and sea. Nevertheless, goats and cows were also living at RH-5. Probably they were not kept primarily for meat, since there was always plenty of it around and in many different forms, but for a resource of greater nutritional value almost unavailable across the wilderness: milk. This will explain why their bones only appear in small quantities on the site (see window 4.2). On the other hand, throughout Arabia, where water sources are rare and often too salty, milk was drunk by itself or added to the water to make it more palatable. For people living close to the sea those domestic animals were then more a source of water than food, very much like portable desalination plants.

Naturally, among people chasing gazelle and other game herds across the desert plains, dogs lived in and around the campsites. In one case parts of a skull were found associated with the grave of an adult man. More surprising has been the discovery of a few equids' bones identified as *Equus asinus africanus*, the ass or donkey that lived wild across the Red Sea, both in Africa and Arabia. Although the fragmentary state of the remains at RH-5 does not allow us to establish whether they belonged to domestic or wild animals, we know from bone remains in Palestine, and dated rock-carvings in the Eastern Desert of Egypt, that during the fourth millennium BC asses were ridden for hunting or used as beasts of burden for all kinds of purposes, as they would be a few centuries later during the Early Bronze Age.

Standard housing at RH-5 comprised compounds of different structures, including at least one circular hut surrounded by small pens, light shelters, and a number of activity areas marked by clusters of



Figure 58:
Ra's Al-Hamra site RH-5: a secondary burial with human bones rearranged in the shape of a turtle (photo Italian Archaeological Mission to Oman).



Figure 59:
A green turtle (Chelonia mydas) reaches the sea after laying its eggs. The picture was taken in December 1985 at 8.30 am, a very late and unusual time as this normally occurs at night. Her back is still covered with sand and she is painfully moving on her flippers. She has almost reached the water and her stomach shell has already been cleaned by a first wave of its usual element. This view of pain and relief must have inspired the thoughts of the 4th millennium people who transformed some of their dead people into turtles (photos Joint Hadd Project).

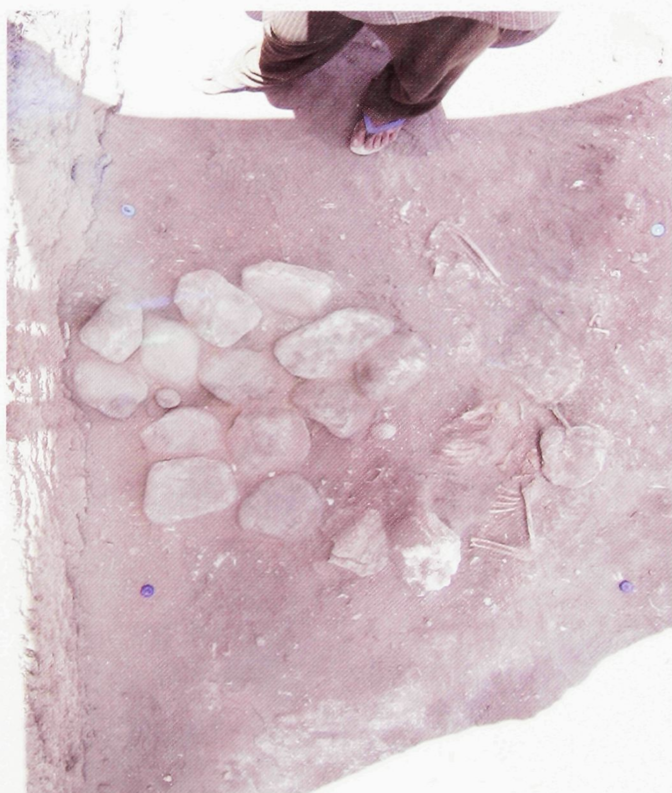


Figure 60:
Ra's Al-Hamra RH-5, grave 05/20, excavated in May 2005. It contained the skeletons of five individuals partially covered with large pebbles (photo Joint Hadd Project).

objects and round shallow pits. The huts were built with light branches and other plant materials held by a skeleton of wooden posts organised in C-shaped alignments and dug closely to each other in the soft ground of the midden, at least 20-30 cm deep. Since in this type of construction the diameter of the wooden trunk is usually half the hole, we reckon that rather small branches were used, 12-15 cm at the base. The wood for construction purposes came from mangroves, junipers and acacia trees, all easily available within a mile of the camp, the best samples cut with stone adzes but most collected across the countryside as dry fallen branches. To hold the wooden posts many of the holes had wedges made with one or more stones still placed on their walls, and in a few cases the vertebrae of large marine mammals were used. Critical points like door jambs or supporting corners were strengthened by grouping several branches together. There were no holes dug at the centre of the circle and we have to assume that no poles were necessary to support the ceiling. This means that the huts were covered with twigs, leaves and light boughs forming a low dome, like the huts still built by the Jebali in the highlands of Dhofar or by the Turkana of East Africa for their seasonal encampments.

Flint, pebbles, shells and bones were used for the making of basic tools, and we may assume that var-

Figure 61:
Ra's Al-Hamra site RH-5: the five individuals of tomb 05/20. There are three adults and two young children who were buried simultaneously. Without further study, the reason for their death is unknown, although violence seems unlikely (photo Joint Hadd Project).



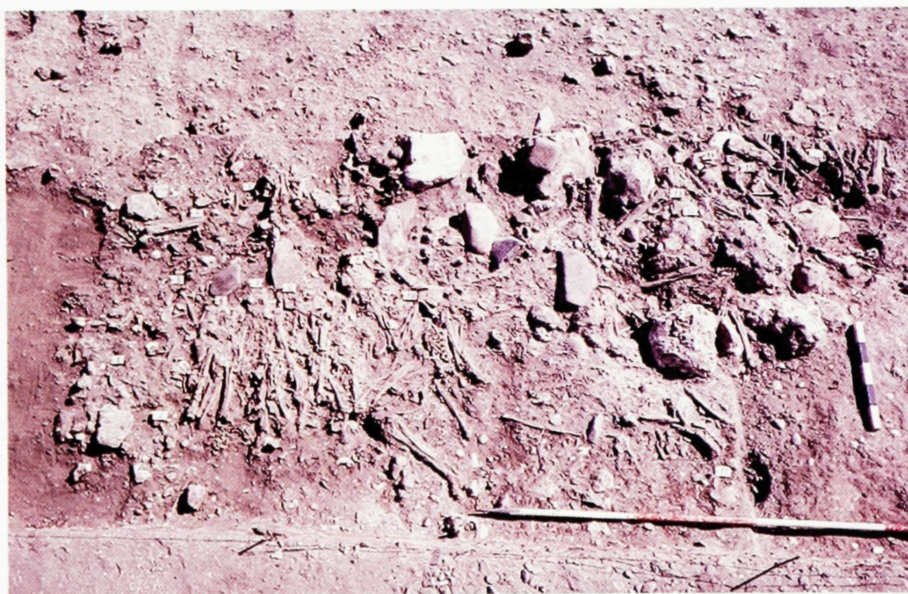


Figure 62 :
Ra's Al-Hamra site RH-5: remains of a collective burial with the bones of some 76 individuals arranged in secondary burials in a stone structure dated to the second half of the fourth millennium BC (photo Italian Archaeological Mission to Oman).

ious items made of perishable materials never or rarely found by archaeologists were in use as well, like bags and baskets. Different kinds of beads and shell ornaments were produced on the site and worn daily and in ceremonies, and especially by the younger adults, as often happens in similar communities around the world. The fine ornaments worn by the young women buried in grave 83 are good examples (fig. 88-89). Nor do they differ from those already used in the 5th millennium BC, with one exception. Leach-shaped ear-rings of soapstone, often decorated with groups of incised strokes, were common and precious enough to be often repaired (fig. 50-52). Their presence throughout the sites may indicate that they were a widely exchanged commodity, as they may be among the few elements not made on the site itself. At least one workshop is known at site GAS-1 on a cliff overlooking the mouth of Wadi Shab. Some large pierced conch shells were probably used as trumpets (fig. 54 rigth). Other musical instruments could have been rhombs, leaf-shaped flat pieces of wood, bone or stone

attached to a string that allows for rotation in the air, producing a loud roaring sound. Two of them made of stone was recently found on site KHB-1 at Ra's Al-Khabbah in the Ja'alan (fig. 54 left).

As before, the dead were buried on the site itself, most probably in areas that were not settled at the time of burial. The excavation of some 215 graves at Ra's Al-Hamra RH-5 has yielded elements of paramount importance for an understanding of the inhabitants of the site, their beliefs and their way of life (see window 4.1). From them we know that they were rather genetically isolated, due to a high rate of interbreeding, and that their average lifetime was short, rarely more than thirty years, and often much less. This was especially the case for women, who often died pregnant or when giving birth (fig. 55-56), in which case the baby was sacrificed, as no one in the community could arrange for its survival. It appeared that another child, still depending on its mother for food, was also sacrificed for the same reason. Such sad events are known in many similar communities around the world, the most spectacular being evidenced in a 4th millennium BC cemetery at Vedbaek near Copenhagen in Denmark, where a ca. two-year old child had been sacrificed and buried in a swan's wing face to face with its mother, who had died while giving birth to another baby. This may sound deplorable but there was no cruelty in it. Affliction and sadness were also present: the older child at Vedbaek had been buried with a miniature flint dagger near his waist, as he was a small male. On the other hand, badly disabled individuals affected by serious forms of a disease like *spina bifida* (fig. 30), who were certainly unable to work, had been cared for and fed by the community throughout their lifetime, whatever burden they constituted. Life, simply, was very hard.

The burials also indicate the importance of large green turtles (fig. 58) in people's religious beliefs. Some of the dead were almost transformed into turtles, something probably expected by fishermen who were permanently exposed to the risk of drowning in the ocean. These extraordinary creatures that move freely and gracefully into the sea and come ashore at regular intervals to painfully lay their eggs, and whose hatchlings turn back to mature in the ocean, are still very important in the mythologies of some fishing communities in the Indo-Pacific area. They are considered as the ancestors of sailors and sometimes even as ancient sailors. According to Greek authors, the fish-eaters *(Ichtyophagoi)* who populated the coasts of the Arabian Sea considered



Figure 63:
Ra's Al-Hamra site RH-5: 29 - sharks' teeth perforated at the base to be hafted as arrowheads, from site RH-5 at Ra's al-Hamra (left). Side (upper right) and frontal view (left) of lower part of a man's backbone from the collective burial with sacral vertebra penetrated by an arrowhead made from a shark's tooth. (photo Italian Archaeological Mission to Oman).



Figure 64 - Ra's Al-Hamra site RH-5: an almost complete pot of burnished grey ware found in a pit dated ca. 3400 BC. Chemical analysis has determined that it was imported from South-Eastern Iran, and was used to cook bitumen, originating from central Mesopotamia, for the caulking of a fishing boat (photo Italian Archaeological Mission to Oman).

themselves as having fish ancestors (see window 10.3) and we may imagine that turtles could have also played this role in the 4th millennium BC.

From the fish catches and from the preferential orientation of the tombs in the cemetery (see window 4.1) one can deduce that the Ra's Al-Hamra promontory was mainly settled for almost half of the year in autumn and winter. The community probably spent the hottest months in the mountains, reaching them through the Wadi Aday valley, perhaps splitting into smaller groups to cope with water and pasture scarcity. When walking through the narrow canyon today occupied by the Muscat to Quriyat road, one can imagine that they passed near the nicely carved ibexes still visible nowadays on the rock face on the right side of the road. Entering the Al-Ameerah plain, they probably found some fresh grazing possibilities and some hunting grounds where they may have met with other groups coming from Yiti, Bandar Kheyran or even the more distant Quriyat. We may at some time find in this area some spring camp sites comparable to what Al-Buhais 18 was a millennium earlier (see window 3.1), but all this remains hypothetical. However rich our knowledge of life at Ra's Al-Hamra might be, it is only part of the story. We know that similar groups used to gather at regular intervals in larger congregations to celebrate rituals, solve quarrels (and trigger new ones), and negotiate matrimonial alliances, etc. It sometimes happens that such places are marked by more or less important constructions, like the alignments of standing stones at Rajajil in northwestern Arabia or those of Al-Mahandad in the Yemeni Tihama that probably date from that same period. But most often they leave no remains able to attract the archaeologists, and such was probably the case in Oman.

Some premises of the Great Transformation

Many archaeologists devote considerable time and effort to finding what they call transitional layers, where they expect to read from material remains the process through which a society transforms itself. And sometimes they pretend to have found



Figure 65:
Various types of 5th and 4th millennium BC shell-hooks from eastern Oman. In the lower row are shell hooks at various stages of production from site RH-6 at Ra's al-Hamra (photo Joint Hadd Project).



Figure 66 - Various types of net sinkers. In the upper row are 5th millennium BC items from Ra's Al-Hamra, site RH-6. The other objects are 4th millennium BC items from the Ja'alan (photo Joint Hadd Project).

them. This is unfortunately an illusion. The mechanisms of such transformations are grounded in human mental and social processes and what we see in material remains is only their result, once the transition is complete. We may even excavate from stratum to stratum a site where change took place and not be able to see anything except what was there before and after. Most specialists on the origins of cuneiform writing in Mesopotamia, for instance, believe that writing came into use as a complete system in a very short time, perhaps within a single human generation. They hold that it was later refined and improved over the centuries, but that from the beginning it was already a writing system with all its properties: there was never, that is, a primitive or "half writing system" (i.e. with only some properties of the kind) that some archaeologists have recently been seeking. We can only explain transitions by carefully documenting initial and resulting situations, and by trying to figure out what may have happened by reference to the way human societies behave. Such a risky and hypothetical task is frustrating and of dubious value for specialists trained to base their demonstrations on material facts; but we should always remember that the main concern of archaeology is not objects but the human societies that designed, produced and used them.

Before the end of the 4th millennium, probably by 3100 BC, major changes had already happened: a sophisticated farming system was introduced with the establishment of oasis settlements along the foothills of the Al-Hajar mountains from Ra's Al-Khaimah to the Sharqiyah; metalworking and pottery manufacture had transformed technology and material culture alike; fishing was no longer a subsistence activity but was practised on a massive



Figure 67:
Aerial view of site KHB-1 on the cliff between sea and lagoon between fossil lagoon (left) and the ocean (right) taken from the south. The red circle indicates the extent of the site (photo Joint Hadd Project).



Figure 68 :
Circular trenches remaining from light shelters on site KHB-1, ca. 4000 BC (photo Joint Hadd Project).

scale, with evidence of preservation techniques to allow shipment of the catch. This contrasts strongly with what has been described before. We may not be able to read this transformation at sites dating from between 3300 and 3100 BC, although we know some of them. For the purpose of this presentation, we had better consider the Great Transformation as a black box and try to understand it by studying what came before and what came after it. Also we should try to find some premises and learn from the way it consolidated once it had happened.

There is a simple but unsatisfactory way to explain the transformation. Considering the fact that some of the plants and techniques used in the oasis revolution (among them metallurgy and pottery) came from foreign countries where they had long been in use, some authors have argued that everything was introduced by foreigners who settled an almost depopulated country mainly to meet a soaring urban demand for copper, whose rich deposits in Oman had been ignored by late prehistoric communities. Mesopotamia, Southern Iran, and even Yemen have been suggested as the original home of the newcomers who replaced, or at best absorbed, an aboriginal population almost exhausted from genetic drift due to isolation. There is no doubt that, with the use by Mesopotamian cities of exchange net-



Figure 69:
Large circular hearth on site KHB-1, ca. 4000 BC (photo Joint Hadd Project).

works already active for millennia in the Gulf, the 4th millennium BC communities of Oman experienced various forms of destabilisation. There is also no doubt that many of the techniques involved in the Great Transformation were imported, mostly from across the Strait of Hormuz. But from what has already been revealed, and from what will be revealed later, there is also no doubt that the scenario was not so simple. The local communities of Oman were not only not exhausted but managed to transform themselves in order to integrate the new technologies and keep control of the whole process of change. If some foreign groups came to Oman, and we may suppose that they did, they merged into the local communities and not vice versa.

Excavations at Ra's Al-Hamra RH-5 and various other sites such as Wadi Shab GAS-1 or as-Suwayh SWY-2 have yielded some of the premises underlying the transformation, or at least some signs of approaching destabilisation. Again we may take some lessons from Denmark, which experienced around the same period a similar situation that can be studied from a much larger amount of data. While mainly remaining foragers and fishermen, Danish



Figure 70:
Fragment of a limestone bowl from KHB-1, 5th millennium BC (photo Joint Hadd Project).



Figure 71:
Late 5th millennium BC burial in a simple pit at site KHB-1, Ja'alan. Two or three large stones covered part of the skeleton, whose forelegs and feet lay almost out of the pit (photo Joint Hadd Project).

communities progressively incorporated from their Neolithic neighbours of Northern Germany various types of items like pottery together with domestic animals and some cultivated plants (mainly barley, probably to make beer rather than bread!), before moving to a completely Neolithic economy by the end of the 4th millennium BC. Danish archaeologists have established that the period immediately preceding this transformation was one of increased instability, with violent conflicts and an affirmation of territorial ownership through the development of monumental graves and complex rituals. The development around 3400 BC of collective burials, as in area 43 at Ra's Al-Hamra RH-5, that contained the mingled remains of some 76 individuals (fig. 62), may signal a comparable situation (see window 4.1). The use of collective burials at the same time as individual burials was nothing new in itself, as it is known from Umm Al-Quwayn 2 or Al-Buhais 18 in the 5th millennium BC, but for the time of area 43 it was just about to become compulsory. There also we see the first recorded traces of violent death, as one of the buried individuals had been killed by an arrow that had cut through his belly, its head remaining embedded in the front of a sacral vertebra (fig. 63). This arrowhead was a shark tooth with two pierced holes in its bony base, an object often found but usually interpreted as a decorative pendant! As a matter of fact, many others were found scattered among the bones of area 43, and also in other graves and at many 4th millennium BC sites. Not all had killed the buried individuals, as they were probably also deposited in quivers near the body of their owner. It is to be noted that such items survived the transformation, as they have been found in the "Hafit type" cairn burials of Ra's Al-Jinz RJ-6, dating from around 3000 BC.

The appearance of new techniques is a favourite way of looking at transformations and explaining them. This is indeed a powerful tool although it should be used with appropriate care. Because western civilisation has based most of its development on new technologies, we tend to be convinced that once something is "invented" its effects on the economy inevitably transform society. Most of our reconstructions of history, punctuated by the pace of "discoveries", are grounded on such beliefs. Leading authorities on the history of technics, however, tell us another story. Technics, they say, can only influence the evolution of a society when mentally integrated into the way that society understands

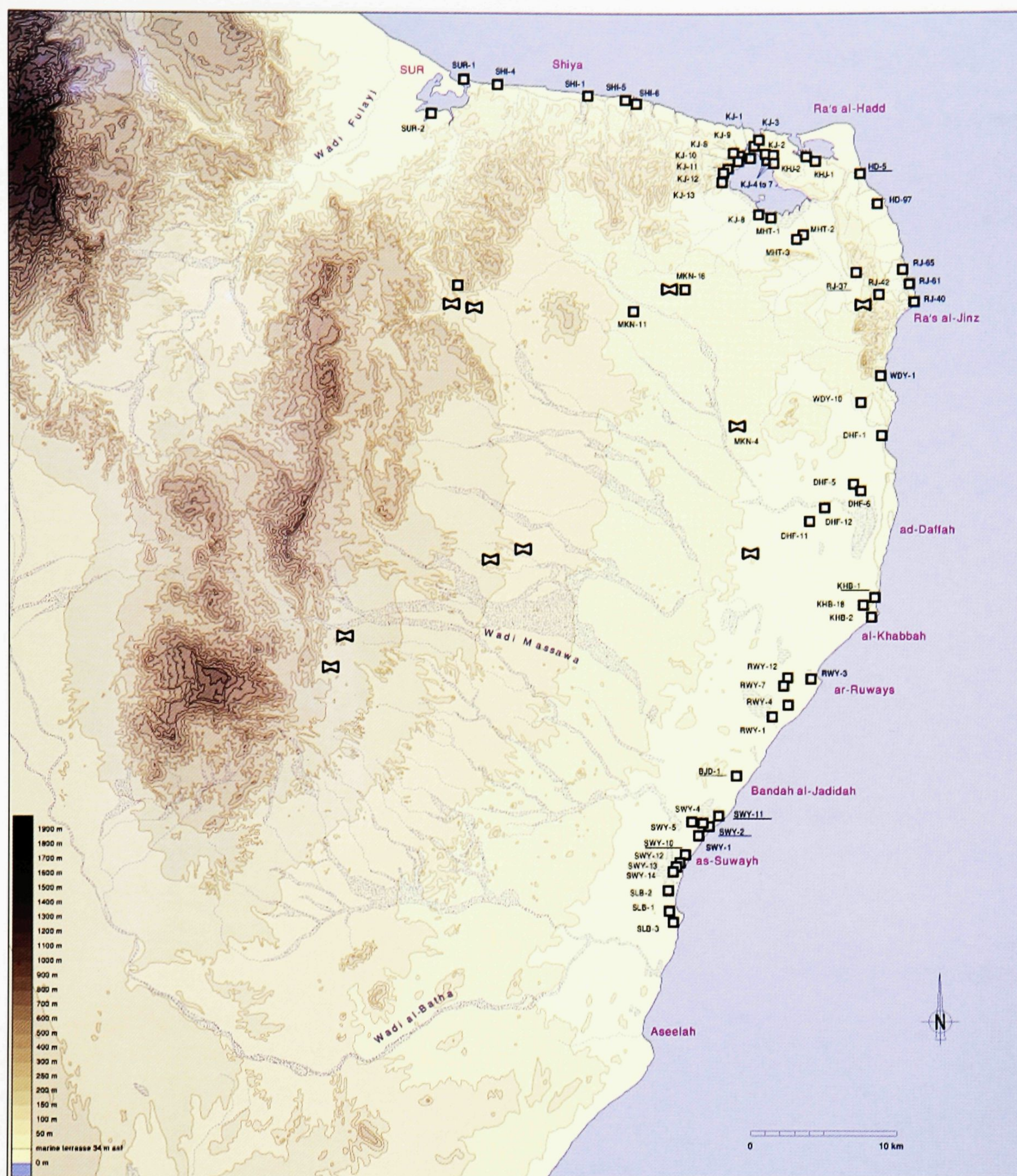


Figure 72: Middle Holocene fishermen and foragers of the Ja'alan. The exploitation of the sea and the coastal lagoons is the major accomplishment of middle Holocene times. Campsites are scattered all along the coast and around the margins of present and past lagoons. The earliest ones found date to the end of the early Holocene, but earlier ones are probably buried in the sea or under lagoonal sediments.

Occupation was seasonal: at least the same number of sites should be found in the interior along the many wadis that drain eastwards from the mountain ridge of Jebel Qahwan – Jebel Khamis. These camps were probably placed the closest to the water. Most of them would have been washed away or covered by sediment with changes in the water courses. Flints are scattered everywhere in these areas: wherever he stops, a few steps from the car, a trained person finds them. The question is to establish how many flints per square unit represent a site. A theoretical discussion may last for ever, but there is a discriminator we ought to keep in mind. Since nothing but flints and other stone tools are found, the critical division to for analysing a territory is between campsites where people lived and flint knapping workshops. Quite obviously campsites are identified by the higher percentage and variety of tools found, indicating the contemporary performance of several activities, while the far larger percentage of wasters is the indication for a workshop.

Human presence and animal exploitation in the interior are well indicated by the distribution of tethering stones (chapter 3). Regardless of whether the animals were domestic or wild, tethering stones indicate economic exploitation across the interior. Only a few of them have been found so far, while thousands are probably still lying around (drawing by Hélène David).

Figure 73:
Aerial view of the mouth of Wadi Shab, with a prehistoric site on the left. This view, taken in the early 1970s, was displayed in the first school book on the geography of Oman. It represents the area before any development took place.



Figure 74 :
mid 4th millennium burial at site GAS-1, Wadi Shab. The strongly contracted position contrasts with the grave at KHB-1 (photo Joint Hadd Project).



the world in which it lives and designs its actions accordingly. To take only one example, the ancient Greeks had a sound knowledge of mechanics as a complex assemblage of gears. They could use it to make sophisticated models of celestial movement, like that found in a 4th century BC wreck on the coast of Antiloytera Island, and many other marvels, including very accurate clocks, like those designed by Ktebisios or Heron of Alexandria. Scientists like tales on Archimedes were able to elaborate on relevant mathematical knowledge. But all this was never developed to an industrial level. This essential sector of economy was based wholly on servile work and nobody would have foreseen the possibility of developing it in another way. The same knowledge of mechanics was used by the Byzantine and Arab civilisations to produce various kinds of automates that fascinated western travellers and were improved by scientists like Ibn Sina or Al-Djazari. They were introduced into late medieval Europe and first used

to produce marvels for the powerful. When the French King Louis XII entered Milan in triumph in 1499 AD, he was welcomed by a mechanical lion that stopped in front of him and opened its chest, showing the French royal emblem it had as a heart. The lion had been made by Leonardo da Vinci. It is only with the industrial revolution, itself a product of the development of a capitalist economy, that mechanics enters the sphere of economic production, quickly and definitely transforming the social, economic and daily life of millions - increasing to billions with European global expansion. This shows again that, left alone, the material finds of archaeology are dumb.

By 3400 BC, pottery first appears at RH-5 in the shape of an almost complete vessel and a few sherds (fig. 64). Both are foreign products. The complete vessel belongs to a class of grey polished pottery that started to be produced around this period in south-eastern Iran, while the other sherds originate from Mesopotamia. Little can be said about the latter, but the grey pot is much more interesting. We have already stated that south-eastern Iran was highly developed at this time, agriculture and metallurgy being in use since the 6th millennium BC, and there were certainly contacts across the sea between Oman and these regions. The Strait of Hormuz is less than 80 kilometres wide and the many islands of

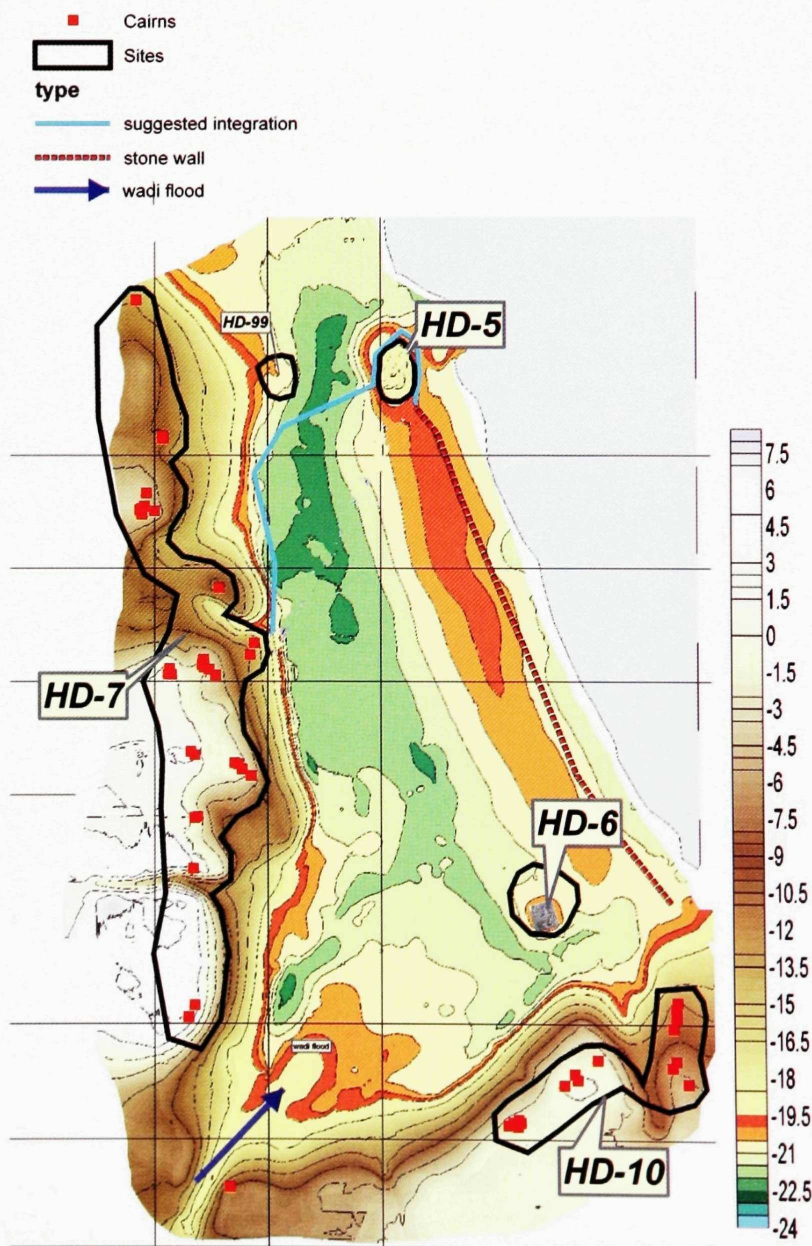


Figure 75 :
Map of the southern fossil embayment south of Ra's Al-Hadd village, with main archaeological sites (document Joint Hadd Project / Bernardo Rondelli).



Figure 76:
A kite view of the early 3rd millennium settlement at Ra's Al-Hadd HD-6 (photo Joint Hadd Project / Yves Guichard).

the eastern Gulf could facilitate its navigation. The grey pot of Ra's Al-Hamra is the first evidence of such contacts. More interesting is its use. A black tarry incrustation was found on the inner surface of the bottom part and was analysed as being basically composed of bitumen by the geochemical laboratory of Petrol Development of Oman, less than a mile away from RH-5 in Qurum. Sifting the loose soil filling the pit, in which the vessel was found broken into more than sixty pieces, yielded also a lump of identical material some five centimetres long, evidently moulded against the inner carination line of the vessel. We may safely conclude that some kind of caulking material based on bitumen was heated in the vessel. Also severe alterations by heating or fire are evident on its bottom part. Further analysis has determined that the bitumen itself originates from northern Iraq.

Although such uses of pottery are not uncommon, the grey polished pot of RH-5 was certainly not used in a way expected by its producers; instead it became integrated into an extremely important activity for its owners: the caulking of sea-going boats. It would be fascinating to elaborate further, but this unfortunately is very difficult. Caulking reed boats was known in the Gulf from at least the early 5th millennium BC and it is no surprise to see it at RH-5, where it may even have been in use earlier. On the other hand, and without any information on the way caulking was carried out later, we cannot decide whether pottery was commonly used in the process or if the combination of a grey pot and of bitumen at RH-5 is exceptional. From our own experience in reconstructing a bitumen-coated reed boat, however, (see window 7.3) we tend to assume that this was actually a common process. This may be confirmed by the discovery at Ayn as-Sayh near Dhahran of a small pot that had contained bitumen associated with fragments of the bitumen caulking of a reed boat. The pot was too small for bitumen transportation but, like that of RH-5, it was perfectly easy to handle in the caulking process. The grey pot at RH-5 is only a fragment of a much larger lost puzzle, but from our point of view it tells us at least one thing: before the Great Transformation the site was already integrated into a larger world, and some technologies were already available to be integrated into those of the society to come. Whether this had long been so or whether it resulted from the growth of previous exchange circuits under the pressure of the rising Mesopotamian states is still a matter for discussion.

Excavations of site SWY-2 at as-Suwayh in the eastern Ja'alan have yielded elements of another

technology that was certainly of paramount importance in the forthcoming transformation. This site is located on a sandbar immediately north of the channel that linked to the sea a lagoon now filled in and dry. The difficult and careful exposure of a living floor over some 100 square metres in the most recent layers, and dating from around 3300 BC, yielded the remains of three circular huts similar to those of RH-5, several hearths and pits, and three parallel lines of postholes that delimited a rectangular plan. From the amount of fish bones, stone net-weights and fragments of shell hooks recovered among them, the excavators have suggested that this rectangular structure should be interpreted as a fish-drying device. The postholes of a fence that lined the compound towards the sea were also found. This is a clear indication that some of the fish-processing techniques allowing for delayed consumption were already in use, and one may expect that fishing for requirements surplus to daily consumption had already started. Whether this surplus was processed for exchange or for the consumption of the local group is unknown. In traditional Oman, dry or salted fish was stored in sand pits that were opened in times of shortage. But we may be sure that the development of such storage techniques had a strong impact on society. Some families were successful at it and some less so, and groups that could mobilise more manpower around the catching and processing of fish could accumulate more wealth, leading to increased tensions. No doubt such trends were at work in the Great Transformation and the obvious increase in population around 3000 BC may result at least partly from such factors. The capacity to pro-



Figure 77:
Another view of site HD-6 from a kite (photo Joint Hadd Project / Yves Guichard).

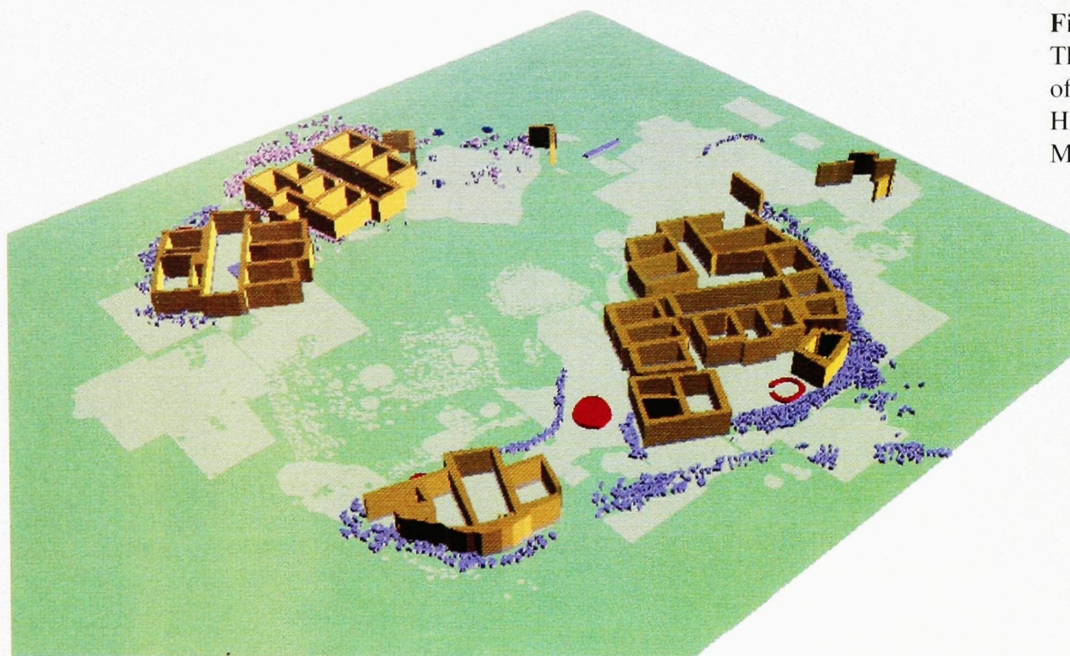


Figure 78:
Three-dimensional reconstruction of the settlement at Ra's Al-Hadd HD-6 (Joint Hadd Project / Maurizio Cattani).

duce more became more important than adaptation of the group size to available natural resources, probably creating new ideas on ideal group and family size and on relationships between families within this group. To anticipate what follows, the population in a settlement like Ra's Al-Hadd HD-6 after the Transformation was certainly several times larger than that at RH-5 or SWY-2 just before it. Here again we must stress that fish preservation techniques were probably nothing new along the coasts of Arabia, as they seem attested to as early as the late 6th millennium BC in Qatar, but their employment may have been very limited among the foragers of Oman. Destabilisation from outside, but possibly also decreased availability of food due to increasingly arid conditions in the 4th millennium BC, led to their general use.

The beginning of copper production from Oman's rich deposits is a most discussed key factor involved in the Great Transformation. Nobody rejects the fact that the country became incorporated into international exchange circuits because it could provide copper to the early Mesopotamian states. Other areas could also provide it, and did so, but the copper of Oman could be transported to the cities of southern Mesopotamia in loads of several tons through the Gulf's existing maritime exchange network, thus matching more easily their rapidly growing needs. We do not know at present of any fragment of copper that was found at an Omani archaeological site dating from before 3400 BC, but more and more copper items are emerging from archaeological contexts that can be dated immediately before the Great Transformation. A small copper knife was found in the most recent levels of RH-10 at Ra's Al-Hamra, and in the Ja'alan some copper fragments are known from SWY-2 or period I at RJ-1. The most informative site is probably GAS-1 at the mouth of Wadi Shab, where several copper fragments, some the remains of pins or chisels, were found in the uppermost layer of a rather restricted sounding. They are worked, with a non-specialised hammering technology, probably from thin rods that were the shape in which the metal circulated. What is important is that a resource unavailable within a short radius of the site became part of the technologies of daily life: within a few generations, the traditional fish-hooks made of shell were replaced by copper ones. Other commodities were also made from a material that came from a distance and was not available everywhere, like the leach-shaped earrings of soapstone widely produced at GAS-1. But this concerned elements of personal decoration which, like shell ornaments, were an important element of exchange at inter-group gatherings, together with much perishable lost paraphernalia. With copper, as with bitumen, we are dealing with a most basic element of economy, making the daily life of the community firmly dependent on the exchange

circuits. Transformation was already on the move and had become almost irreversible.

Fishermen At The Beginning Of A New Era

By ca. 3100 BC, the Great Transformation was over. Three sets of archaeological data are available for us to understand further what had happened inside the black box: the new types of burials, the earliest oasis settlements, and the renewed settlements of fishermen. The graves and the oasis settlements are described in two separate chapters (5 and 6). The graves attest to completely renewed burial customs, as the dead are no longer placed at the sites themselves but are displayed in the landscape, in tower-like monuments that act as indicators of a new territorial and political organisation. The oases are certainly the centres of these new territories but, although there is no doubt they existed, the lack of known earlier sites in these areas does not allow us to apply our black box strategy. Fortunately, the transformations among the fishing communities can be studied from two sites under excavation in the Ja'alan by the Joint Hadd Project: Ra's Al-Hadd HD-6 and Ra's Al-Jinz RJ-1.

The excavations at RJ-1 are just beginning and little can be said at present. The 4th millennium BC is represented at Ra's Al-Jinz by several sites, mainly RJ-2, RJ-40 and RJ-1. At RJ-2, postholes, hearths and pits represent the first settlement on the site. It was located on a small butte of consolidated aeolian sand that had been cut off by the higher sea levels of the 5th-4th millennium BC and overlooked from a 2-3 m high cliff a sandy beach along a small bay - a rather different landscape from the present one. Although radiocarbon determinations indicate that it was settled during the last centuries of the 4th millennium BC, that is, probably at the time of the Great Transformation, the material culture of this period at RJ-2 displays no difference from that of sites like SWY-2 at as-Suwayh or RH-5 at Ra's Al-Hamra. RJ-40, along the eastern edge of the Ra's Al-Jinz cape, is in a completely different situation, on a cliff vertically overlooking the sea from a height of more than 30 metres. It was also a different type of site with almost no archaeological deposits left. Large stones had been arranged to form shelters, and one might have considered them to be much more recent without the discovery on the surface of many

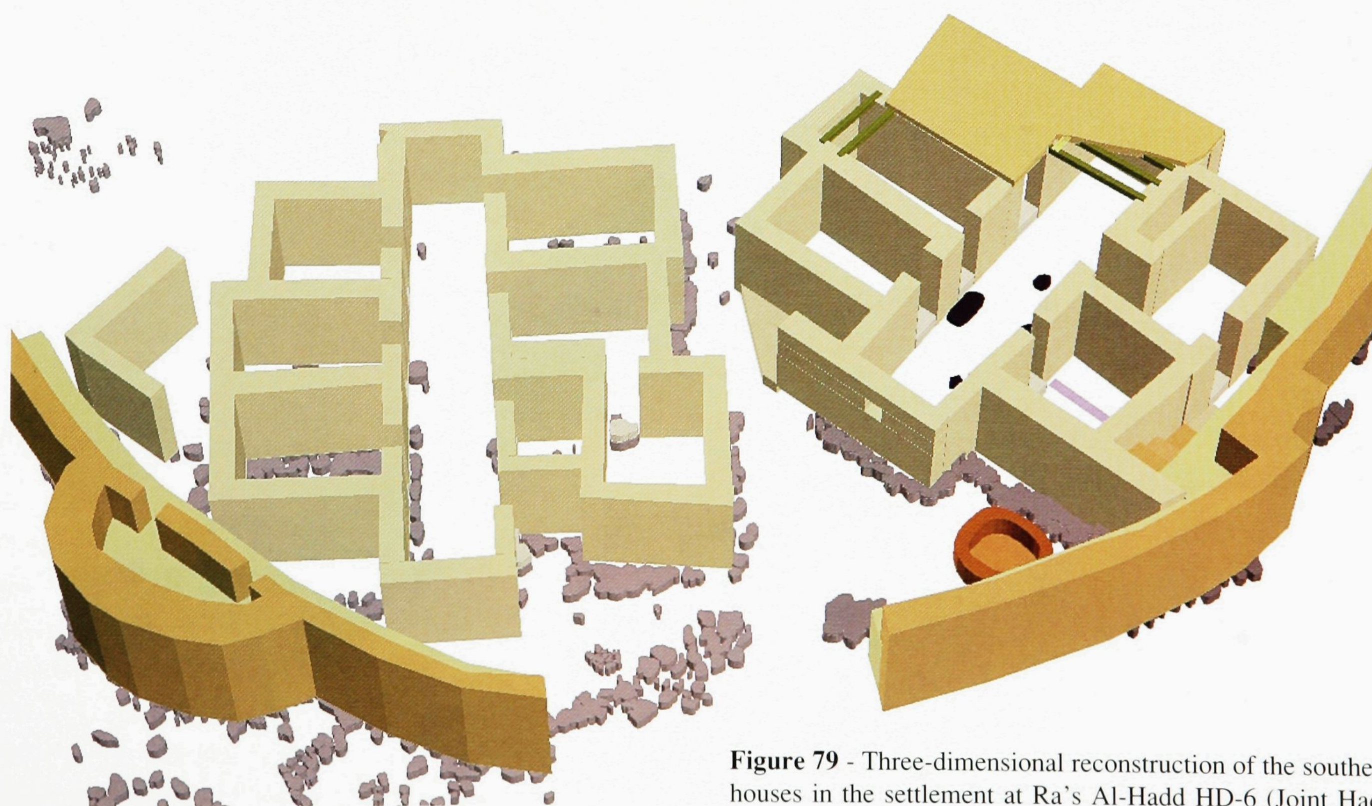


Figure 79 - Three-dimensional reconstruction of the southern houses in the settlement at Ra's Al-Hadd HD-6 (Joint Hadd Project / Maurizio Cattani).

flaked flints and two fish hooks made of shell, clearly late 5th and 4th millennium objects. At RJ-1, on the top of the central mesa, the postholes of circular huts, and at least one hearth, were found overlooking RJ-2. Fragments of two leach-shaped soapstone ear-rings, a decorated shell pendant, and several shell hooks were also found in this ca. 10 cm thick archaeological layer, and the presence of small fragments of copper may indicate a date towards the end of the 4th millennium BC. The scattered remains of pits and hearths were also found below some early 3rd millennium cairn burials at site RJ-6.

Surveys in the larger area of Ra's Al-Jinz have recorded some 200 early 3rd millennium cairn burials within a radius of two kilometres around the site. They are grouped in small cemeteries of 10 to 30 graves, mostly on the edge of cliffs, on rocky outcrops, and for a few of them, like RJ-6, at the foot of hills. These particular types of burial are described in chapter 5. Suffice it to say here that their number suggests that a rather large population, perhaps 200 persons or more, was dwelling in the Ra's Al-Jinz area in the earlier centuries of the 3rd millennium BC. No corresponding settlement site was known until the recent discovery of a small village of clustered stone houses at site RJ-1 on the top of the central mesa. The houses had rectangular rooms and their inhabitants used copper tools, including fish hooks, but little pottery, as only one small sherd was found. Apart from fishing, the inhabitants of RJ-1 at that time were making beads of shell and soapstone. We may confidently hypothesise that RJ-1 was only part of a larger settlement at Ra's Al-Jinz, but it already displayed very interesting similarities with the only well-known early 3rd millennium settlement of fishermen: HD-6 at Ra's Al-Hadd.

HD-6 is a low mound, locally known as Ardiyah, at the bottom of a shallow lagoon, nowadays dry, surrounded to the west and south by a steep cliff some 20 metres high and to the west by a sand spit

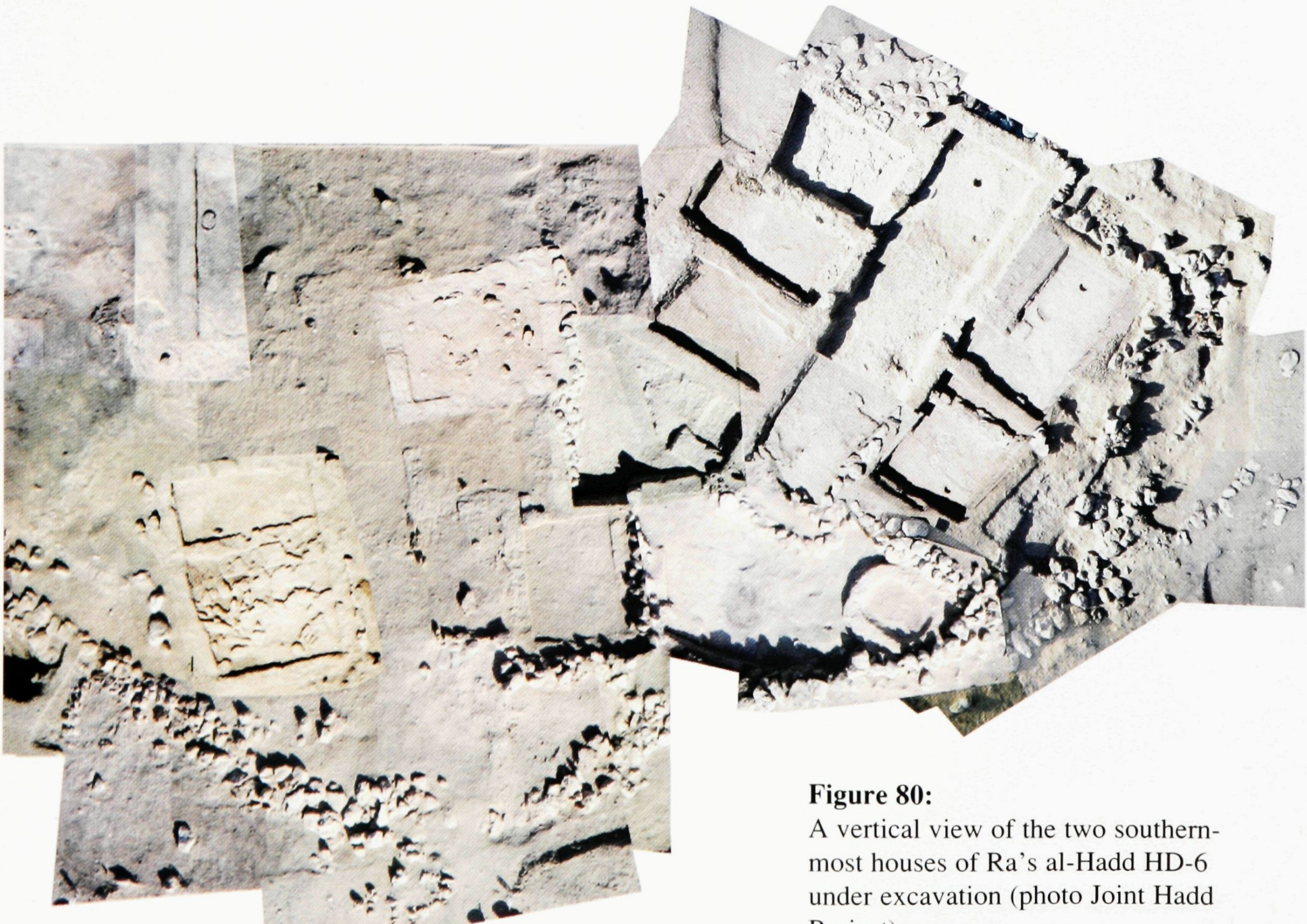


Figure 80:
A vertical view of the two southernmost houses of Ra's al-Hadd HD-6 under excavation (photo Joint Hadd Project).

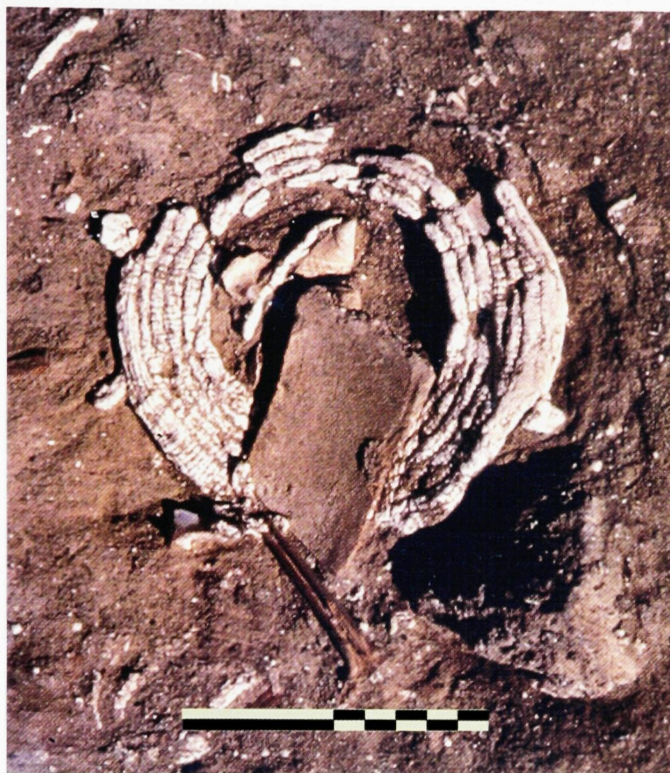


Figure 81 – Remains of a basket where vegetal material has been replaced by calcite at Ra's Al-Hadd HD-6. The large rectangular object partially covering it is a turtle bone (photo Joint Hadd Project).

that separated it from the sea, with which it communicated to the north through a narrow channel just south of the present village (fig. 75). Around 3000 BC, a terrace of clay, mud-bricks and stones, 20 to 50 cm thick and ca. 60 x 60 m wide was built on the top of a sand dune and over the scattered hearths and postholes of circular huts that cannot be precisely dated at present but very probably belong to the late 4th millennium BC. It was surrounded by a stone wall, one metre thick and almost one metre high, whose upper part was probably also made of mud-bricks. Inside, and sometimes outside or encroaching on the wall, the entire surface was densely settled with mud-brick houses. This was the time when mud-bricks as a construction material appeared for the first time in the coastal areas and in the interior at Hili 8. The fact that the mud-bricks used at HD-6 and Hili 8 are almost similar in size and aspect is in itself an indication of the complementarity that united the coast and the interior in all aspects of economic and social life.

As mentioned earlier, the summer monsoon winds induce in the coastal waters of the Ja'alan a yearly phenomenon known as upwelling that brings to the surface deep water with large quantities of nutrients for the phytoplankton, thus providing an extremely rich and abundant marine life. Vast shoals of fish move from south to north along the coast in winter, while in summer, when the heavy waves caused by the south-western monsoon winds make launching fishing boats a hazard, they move far back into the open sea. Fishing was dominant in the economy of the settlement, which was only seasonally settled, in winter. Hundreds of copper hooks and net weights and thousands of fish bones show that these activities were carried out on a large scale, far beyond the requirements of daily subsistence, so that we can assume that catches were cured at HD-6 to be stored and sent to the interior. Many hearths and pits filled with burnt stones, ashes and fish bones have been found all around the main residential quarters. Unexpected was the finding, due to particular conditions of preservation, of the fossilised imprint of ropes, nets and baskets: the perishable material had disappeared and been replaced by concretions of calcium carbonate (fig. 81-82). The mesh of these net fragments, together with the large size of some net sinkers, suggests that much larger nets than before were used to catch more fish with improved techniques. Dolphins and turtles were also caught, the first probably by clubbing when their schools entered the lagoon, the second by killing



Figure 82 – Remains of a rope replaced by calcite at Ra's Al-Hadd HD-6. Fragments of fishing nets were also found (photo Joint Hadd Project).

when they came ashore to lay their eggs. Among many by-products, their fat was probably coveted for storage or exchange. From plants or animals fat is an indispensable requirement for human nutrition that is very scarce in the hyper-arid conditions of the Ja'alan.

Copper by this time was widely used for hooks, pins, knives, chisels and many other small tools that are the products of cold hammering manufacture. Flint from the huge outcrops of Jabal Salim Khamis near Ra's Al-Jinz remain of some use, probably for specialised purposes like fish scaling or bead making. From the thousands of beads found, as finished items or at intermediate stages of the manufacturing process, bead making appears as a very important cottage industry, taking place in all houses on the settlement (fig. 84). Some shell was worked but most important was the making of tiny beads of soapstone, sometimes only two millimetres in size. From small pebbles of raw material to prepared blocklets, non-pierced and pierced rough outs, or fragments of objects broken during the process, they are found in every house at the settlement, while all over the Ja'alan finished beads are found by the hundred and sometimes by the thousand in the collective burials. Here again it is evident that bead making at HD-6 met much more than local needs and that, although at a low degree of specialisation, it was already part of the exchange economy. Tiny beads of heated steatite were also involved (fig. 83). This is a talcum powder made into a paste, drawn on a copper wire, and heated to over 1100°C. The copper vanishes and then the steatite is cut into small sections. These have been found in such numbers that we may also assume them to have been made locally, although no associated workshop has been found, suggesting that this could have been a more specialised craft. Such work demands a high technical mastery of paste composition and of heating and cooling skills generally associated with smelting copper ores and firing pottery: it was, like them, an imported technology.

The houses comprise three to six small rooms, a few square metres each, with sometimes a larger, long one of up to 12-15 square metres (fig. 78-80). With the exception of a few courtyards of irregular shape, there is no space left between the houses that appear to be grouped in twos or threes around these courtyards which were all provided with a large domestic oven. There are in particular no lanes that can be understood as separating the compounds and allowing people to circulate between them. Four of these compounds have been partly or totally exposed, and, considering the size of the site, we may suppose that it might have contained from 8 to 10 of them, suggesting that it may have housed a population of 150 to 200 inhabitants - at any rate far more than the 30 to 60 individuals expected for a site like RH-5 a few centuries before, on the other side of the black box. These rather high figures are confirmed by the excavation of several collective graves in the associated necropolis, HD-10, located some 200 metres away on a cliff overlooking the village to the south. When not too badly destroyed, the monuments contain the remains of ca. two dozen individuals, and, considering that the site was only settled for half of the year, this may suggest a fairly large population over several centuries.

No particular specialisation is evident for the houses and the same activities were carried out in all of them; so we may suppose that all dwellings and compounds were settled in the same way. Some houses appear larger than others, but they did not yield any items that could lead us to consider them as the residence of a higher status family, although we may be sure that some individuals had a leading role at lineage level. There is no building that by its shape or size can be assigned to a special function, and no compound appears larger than the others. From this, one can suggest that the population of HD-6 was organised on at least three levels: the house, the compound, and the site. Nuclear families must have lived in each house, grouped in compounds according to kin relationship, like close relatives in the same lineage. Further analysis may indicate other divisions, probably linked to more distant lineage relations: the tombs of HD-10 are located according to four distinct groups that do not originate from its topography alone, so we may expect that each of these groups corresponded to a lineage division with some reality in the village



Figure 83:
This complete necklace composed of six twisted rows of heated steatite beads was found complete on the floor of a room at Ra's Al-Hadd HD-6: the beads have been re-assembled to appear just as they were found (photo Joint Hadd Project).

itself. Beyond the divisions of age, sex, and, obviously, personal capacities, everybody was involved in the production of food and goods, both for local consumption and exchange, but the surplus was used to obtain materials that, like copper, had to be imported from distant areas in Oman and even from overseas. This renewed pattern of social relationships was aimed at organising acceptable sharing among all participants but also at keeping as low as possible the conflicts in a population that had become much larger within a few generations. Anthropological surveys suggest that in small egalitarian populations of ca. 30-50 people, the number of major disputes arising in daily life and able to seriously endanger group cohesion averages around three to four annually, but this number grows exponentially as a ratio of the number of individuals involved. The solution in the fertile plains became the institutionalisation of hierarchies that characterises development of the early states, leading some families or group of families to take primacy over the others. Economy and land ownership were no longer organised around kinship, and although this is still present in many aspects of society it has lost its status as the sole foundation of any legitimacy. Spectacular graves and new types of buildings and items are the visible aspect of this transformation for archaeologists. This is not what happened in Oman during the Great Transformation. Kinship bonds were reorganised but remained the foundation for everything. What we see in the cemeteries, possibly at HD-10 and much more clearly in the interior, as at Hili, Bat and Bisyah, is the result of what happened during the years of the Great Transformation: the rise of a new level of kinship relationships that had to become dominant over the extended family.



Figure 84 - Various types of beads found in the graves of Ra's al-Hadd HD-10 (photo Joint Hadd Project).

We can call this level the "tribe". Tribes and alliances of tribes became the foundation of economic and social relations, visible for the archaeologist in collective burials and the organisation of territories through the display of these burials in the landscape. The history of the Early Bronze Age in Oman is that of the consolidation of these tribes, which was extremely successful in completely reshaping the indispensable exchange systems that channelled through the whole region the products of the newly-adopted technologies.

The Origins Of Tribal Society In Arabia

These innovations are described in the next chapters. It has already been said that they originated from outside, where they had long been in use. They are clearly associated with the Great Transformation, but their role in it is still a matter of debate. Some authors have supposed that they were introduced by Sumerian metal prospectors, while others are of the opinion that they came to Oman with populations from south-eastern Iran. Arguments in favour of this second interpretation

are their importance and variety, the fact that they were introduced rapidly, and the sophistication of some of them. Pottery, for instance, was produced from the beginning with the most advanced techniques and with shapes and decoration similar to those in Iran, but the chemical analysis of the paste assures us that it was produced in Oman. Palm trees, which demand elaborate treatment to be productive, and the irrigation system used in the earlier oases, also originate from south-eastern Iran. It is quite possible that at least some of these innovations came to Oman with the foreign craftsmen who mastered them, and possibly their relatives, who sooner or later became associated with a more or less special status within the local population. Although we have little evidence, we may assume that relations across the Strait of Hormuz and the Gulf of Oman already existed before the Great Transformation, at least at a low intensity. These must have become much more important by the end of the 4th millennium BC. But it seems that other relationships were involved as well, notably with other countries of the Arabian peninsula.

There are not enough data either to confirm or refute these interpretations, though one could hardly deny the weight of the external factor, given the widespread transformations that occurred across the whole of south-west Asia with the establishment of early states. For many years it has been recognised that the development of Oman's Early Bronze Age civilisation was one aspect of this more general phenomenon of articulation with and a mode of integration into distant regions. What we can say is that by the second part of the 4th millennium BC the foraging communities of Oman had already adopted herding on a reasonably large scale and had developed fishing, and in particular offshore fishing, and navigation capacities. When hit by the extension of commercial circuits promoted by the Sumerian cities to satisfy their growing needs, they were able to rapidly transform, adapting new technologies and ways of life.

Historical studies tell us that such transformations may succeed or fail. The inhabitants of Oman managed to answer the demand by adopting innovations from outside and by transforming their society in a way that maximised the interest of these innovations within local environmental conditions. From what we know of the Early Bronze Age that follows, this adaptation to the new conditions of the surrounding world was extremely successful. Share and exchange among groups remained the main mechanisms of the economy and not, as in the early states, redistribution through a central authority. Jural equality among groups and individuals primarily linked by kinship affiliation was maintained, even if we may be sure that some groups and individuals were more powerful than others, and it remained the structuring principle for everything including the economy, social life and politics. This phenomenon can also be seen in other parts of the Arabian peninsula, notably in Yemen; but Oman is at present where it is best documented. From their prolonged history in Late Stone Age conditions, the societies of Oman and Arabia in general managed to follow a new evolutionary pathway, based upon equality between and within tribes and not upon hierarchy inside states. From the time of the Great Transformation, more than 5000 years ago, this was to dominate the entire history of the region. ❑

Window 4.1
The Prehistoric Graveyard at Ra's Al-Hamra RH-5.
By Sandro Salvatori

The prehistoric graveyard of Ra's Al-Hamra is located on the limestone headland overlooking the mouth of Wadi Aday and the large mangrove swamp of Qurum. It resembles a shallow mound of black soil covered with shells and stone tools, one of the many prehistoric sites dotting the western side of the flat promontory.

The archaeological deposit covers the whole of the promontory, 1.5 m thick at its maximum. Excavations uncovered the remains of huts built of wood and light vegetal material, sometimes with a stone footing. Hearths and large pits filled with the residue of different activities surrounded the habitation areas. Radiocarbon dating suggests occupation between 4200 BC and 3300 BC. The graveyard developed in the north-eastern part of the settlement covered an area of about 250 square metres. One hundred and twenty-one graves were excavated between 1981 and 1985 containing the remains of no less than 215 individuals. At least 76 of these were concentrated in a particular zone (fig. 62) - designated as Area 43 - in the southernmost part of the cemetery. No demarcation identified single burials: most skeletons were fragmented and commingled. There was evidence of fire and of intense activity in some way related to rituals that took place at various stages after the burial. From the archaeological evidence, there is no difference in time between these fragmentary burials and the pit graves in the rest of the cemetery, suggesting that, although only a few families lived at the site, they buried their dead according to two different main rituals. The dates of the graves fall between 3800 BC and 3300 BC.



Figure 85 :
Ra's Al-Hamra site RH-5: a necklace comprising two different types of shell pendants and small chlorite beads, reassembled to appear as they were found (photo Italian Archaeological Mission to Oman).

The pit graves provided much direct information on the culture and the ideology of these early Omani fishermen. There was very little soil and the bedrock was quite hard to dig with stone tools. For this reason, the pits, generally oval in shape, were very shallow. The deceased were buried in a crouched position, lying predominantly on their side, with arms



Figure 86:
Ra's Al-Hamra site RH-5: a three element bracelet cut from conch shell found in grave G.83 (photo Italian Archaeological Mission to Oman).

bent and hands placed in front of, or under, the head. In some cases the deceased held in their hand a Callista shell valve, sheltering their face.

Mortuary gifts were few in type and more or less limited to personal ornaments. Almost all the deceased were accompanied by what might be considered a ritual food offering or the remains of a funeral banquet. This generally consisted of molluscs, fish, and marine turtle (Chelonia mydas), as indicated by the skeletal remains. Whole turtle skulls were placed in some cases directly against the face of the deceased. The remarkable importance of the turtle in the funerary ideology of the prehistoric fishermen at Ra's Al-Hamra is indicated by other elements, such as the presence of thirty or more perfectly round pebbles in the cover of the grave, replicating the turtle eggs deposited in their nests on the beach. In a few secondary burials, the bones of the deceased were rearranged, neither in an anthropomorphic way nor casually, but carefully laid in the pit to form an oval with the head at one end and the protruding leg bones at the other, evidently imitating a short tail. These people probably believed that



Figure 87:
Ra's Al-Hamra site RH-5: a large grinding stone was found among the stones covering one of the graves. Such a grinding stone could have been used for crushing plants for food preparation (photo Italian Archaeological Mission to Oman).



Figure 88:
Ra's Al-Hamra site RH-5: close-up view of grave G.83, mid-4th millennium BC, with a young woman wearing a bracelet, ear-rings and elaborate head dress (photo Italian Archaeological Mission to Oman).

after death they would be transformed into the ancestral animal. The myths of many primitive populations of the Indo-Pacific area refer to the turtle as their totem, either their ancestor or a materialisation of their gods. The graveyard of Ra's Al-Hamra provides the earliest archaeological evidence of this symbolism that probably goes back many thousands of years. Together with turtle bones and food offerings, large marine shells were deposited inside the grave or among the covering stones. Some had been cut, others perforated. It is possible that they were used as containers and drinking vessels.

An important aspect of the data gathered concerns funeral variability, that is, the treatment of the corpse and the method of burial. The majority were buried in a crouched position, lying on their sides with the head at a constant north-eastern orientation. While most were lying on their right side, a certain number of individuals lay on their left. Numerous double or even multiple burials were found, while in a few cases women were buried with one or more young children. The best cases were represented by grave 15, where a young female, 15-18 years old, was buried with a new-born baby, and by grave 21, in which a woman, a new-born baby, and a 2-3 years old child were buried together (fig. 56).



Figure 89:
An artist's reconstruction of the woman in grave G.83 (drawing by Hélène David).

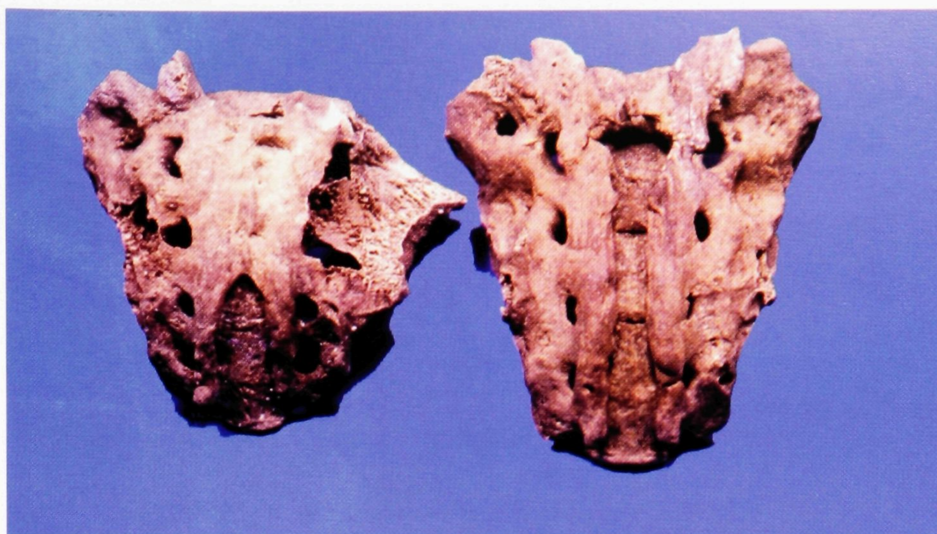


Figure 90:
Ra's Al Hamra RH-5: two very acute cases of spina bifida. When minor, the disease is harmless and many people live with it without knowing. But the two individuals represented here were probably utterly disabled and would not have survived without the help of the community (photo Italian Archaeological Mission to Oman).

Another method of disposal is indicated by secondary burial. These are graves where the body had been reassembled, probably because the person had died away from the site and custom required that the dead must rest in their home place.

Personal ornaments of the deceased included necklaces, bracelets, and earrings made of stone and shell. Very rare were objects used as tools, such as shell fish-hooks, bone awls, and net weights. A large granite grinding stone was found among the covering stones of Grave 61, containing a 25-30 year old male, while an almond-shaped blank of fish-hook manufacture accompanied a 24-30 year old female in Grave 66. Necklaces were made with strings of cylindrical beads, assembled by alternating black soapstone with shell (fig. 85). At regular intervals, beads were interspersed with shell pendants, usually laurel-leaf shaped with incised stroke patterns around the edges. The pendants were made by chipping a rough-out from a large valve and then by working the edges with a limestone file - the same technique used for making hooks. Another type of shell pendant, less frequently found, was drop-shaped with the surface decorated by a cup-hole pattern and the usual incised stroke patterns along the edges. A third type, even less frequent, was represented by a shell pendant cut in the characteristic triangular shape of a shark tooth. Also, several actual shark teeth were found, pierced with two holes in their bony base. Many were found displaced among the bones of area 43 and five in Grave 68 Inf. It was long thought that these pierced shark teeth were a type of pendant until, many years after the excavations, physical anthropologists working in Rome on human bones from area 43 found one of these "pendants" deeply embedded in the front face of the second sacral vertebra of a man. It was evidently an arrowhead and the man, in about 3400 BC, was killed by it.

Other than necklaces, relatively common among mortuary gifts were shell plate bracelets, cut from the walls of the large gastropods, and soapstone earrings. The bracelet plates were rectangular and to ensure complete closure around the wrist each was perforated along the shorter sides to allow fastening (fig. 86). A bracelet was usually made of three plates and many were decorated with the usual incised stroke patterns along the longer sides. Earrings were cut from flat pebbles or slabs of dark green soapstone. They were typically made in the shape of an open ring, larger in the middle and sometimes decorated with incised patterns or cup holes. We are sure about their use as earrings because they were found still in place on both sides of the head, as in grave 51.

The most interesting burial was Grave 83, containing the skeleton of a young woman with a more elaborate set of ornaments that may help to reconstruct the appearance of women at Qurum in the fourth millennium BC. She was provided not only with a long necklace with laurel-leaf shaped pendants, two stone earrings, a beautiful shell plate bracelet, and a less striking one made of soapstone

and shell beads, but also with a string of small perforated Nassarius shells that were found above her head. Among these small shells were also found two polished bone pins set crosswise, indicating that her hair was arranged in a chignon held by the pins and decorated by the string of shells (fig. 88).

Near the head of the young woman there was also deposited what may be interpreted as a cosmetic kit, consisting of a few small, pink stone pebbles and a pair of small blocks of pyrolusite (a manganese oxide) with polished surfaces. On the first pebble was clearly visible a platform for rubbing the blocks of pyrolusite that left a dark coating of the residue. The set included also a short bone splinter with pointed ends that might have been used to apply the powder to the woman's face. Also on top of the head there was a Callista valve that originally might have been held in the right hand to cover the face, as known from other burials. The burial gifts in this, the richest grave at Ra's Al-Hamra, included also an intact specimen of a Tonna shell that might have been used as a container for liquids and a pearl near the woman's hand.

Grave 83 is the richest burial, yet shows no particular wealth. To the social historian, the graveyard of RH-5 indicates beyond doubt that in the second half of the fourth millennium BC the small group of fishermen occupying this headland was still largely egalitarian.

Anthropologists have confirmed after many years of careful study that the people buried at Ra's Al-Hamra in the fourth millennium BC were physically very homogeneous. Variations in their general stature were few and also the difference between men and women was very slight. Such evidence, together with a high frequency of pathologies with a strong genetic load such as spina bifida, indicate that these fishermen were a genetically isolated population with a low rate of genetic drift, probably determined by inbreeding.

By using the standard parameters of paleodemographers, it is possible to estimate the average size of groups living on the headland at about 15 individuals. This number is obviously too small, since the minimum size of a band of foragers in a prehistoric society should be between 25 and 30 people. There are different explanations for this. Most probably it was only one of two burial grounds used by the community. The other one was either a short distance away in the same area or at a greater distance in the interior. In the first case, our graveyard was used by only one of the two kinship groups that made up the band, the so-called binary system of double descent well known among such foraging communities in ethnographical studies. In the second case, we are dealing with a burial ground used during the seasonal occupation of the site. All hunter-gatherer groups have a degree of seasonal mobility, with a main campsite for the winter and a second for the summer. This second hypothesis is the most probable, and it is even possible to suggest the season when the dead were buried at Ra's Al-Hamra by observing the orientation of the skeletons. Almost all of them were laid with the head directed to the north-east. They all fall, both primary and secondary burials, within the ninety degrees of the north-eastern quadrant. The face of the individuals laid on their right side looks towards points from north-west to south-east, while those buried on their left side invariably looked towards the south-east. We interpret this constant orientation as the result of an intention to orient the eyes of the dead towards a precise point on the horizon. This would correspond to sunrise from the end of the summer and the beginning of the winter, between August and December, and in the case of those buried on their left side to the sunset position during the same period of the year.❑

Window 4.2
Shell Midden Economy in the 4th Millennium BC.
By Margerethe and Hans-Peter Uerpmann

The formation of a shell midden is closely related to the subsistence of its former inhabitants. The shells, which are the name-giving component of the midden, are the remains of many meals, indicating that shellfish-gathering was a major occupation of those who lived there in ancient times. Along the coast of Oman shell middens are concentrated in areas with high ecological diversity, which is important for long-term exploitation of the mollusc fauna. Shell middens usually contain two or three dominant mollusc species with diverging ecological requirements.

The mudcreeper, Terebralia palustris, can be dominant at sites where mangrove stands provided a habitat for this large snail. It is easy to collect, because at low tide it stays exposed under the mangrove trees. Of equal importance was the oyster, Ostrea cucculata, which occurs in large numbers both in the mangrove and along rocky shores. Those lying on the stems and air-roots of mangroves are easy to harvest, while separating rock-oysters from their substrate is quite difficult. Like Terebralia, oysters live in the intertidal zone which is accessible to humans at low tide. The third group which may dominate a midden are the arc shells of the genus Anadara, which are regularly found washed up along beaches, but rarely seen alive, because they live hidden in the sand. Depending on local circumstances, other species can also be dominant in particular environments. Where middens formed over longer periods, their mollusc spectra may change through time, indicating that harvesting strategies altered with the reactions of the mollusc populations to exploitation and fluctuations of environmental conditions.

While shellfish was the most visible source of protein for the coastal population during Oman's Late Stone and Early Bronze Age, it was not necessarily the most important one. The shell midden inhabitants of the 4th millennium had the same domestic animals that were introduced to the area by the early nomadic herders who roamed the country

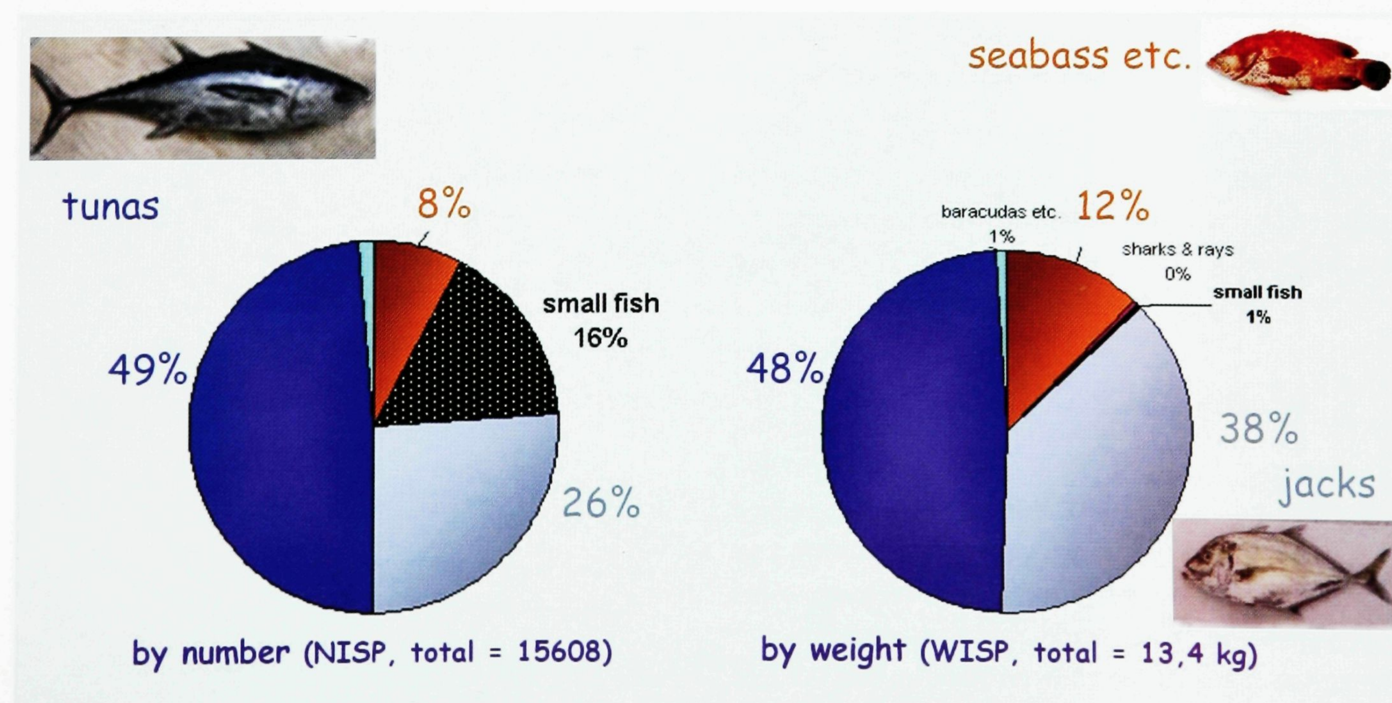


Figure 91 – Diagram of fish remains at Ra's Al-Hamra RH-5 (M. & H._P. Uerpmann).

during the 5th millennium BC. The bones of sheep, goats, and cattle are found in the middens in small quantities. In addition wild asses, gazelles, and other wild animals were hunted as well as some of the large coastal birds and many turtles. The major subsistence-related occupation, however, was fishing.

Net sinkers of stone and hooks made of mother of pearl or bone are visible remains of fishing gear, indicating that fishing technology included netting and line-fishing. In addition, the use of mobile and stationary fish traps – which would have left no archaeological trace – can be assumed. Quantitative analyses of fish remains from some shell middens were made for sites near Quriyat and in the Capital Area. It is obvious that a variety of marine habitats were exploited. The most frequent remains among the fish-bone collections from Ra's Al-Hamra RH-5 and Khor Milkh KM-1 are those of tuna and other middle-sized Scombridae and those of large jacks and kingfish of the family Carangidae *(fig. 91)*. Some smaller bones come from much the same species and size groups found in the fish markets today. Small fish (sardines etc.) are quite frequent by find-numbers, but are not of economic importance because of their small weight. On the whole, the fish bones indicate fairly specialised fishing from craft in deeper waters, where the big fish must have come from. In addition, there is some evidence for the exploitation of lagoonal environments.

Even without mentioning the vegetal part of the nutrition, much research remains to be carried out in order to decipher the balance of the subsistence of the shell midden inhabitants of Oman. While the sea provided enough animal protein, there may have been a lack of red meat. The flesh of mammals and birds is of particular importance for populations suffering from malaria and other parasitic diseases, because they always lack enough of the digestible iron contained in red meat. It seems possible that the shell midden population only lived there during part of the year. In summer, some may have gone to the mountains with their herds, living a different life there. And some of the rock art may be their visible legacy. ❑

Chapter 5

A Greater Society Looms Under the Eyes of the Ancestors

Chapter 5
A Greater Society Looms Under the Eyes of the Ancestors

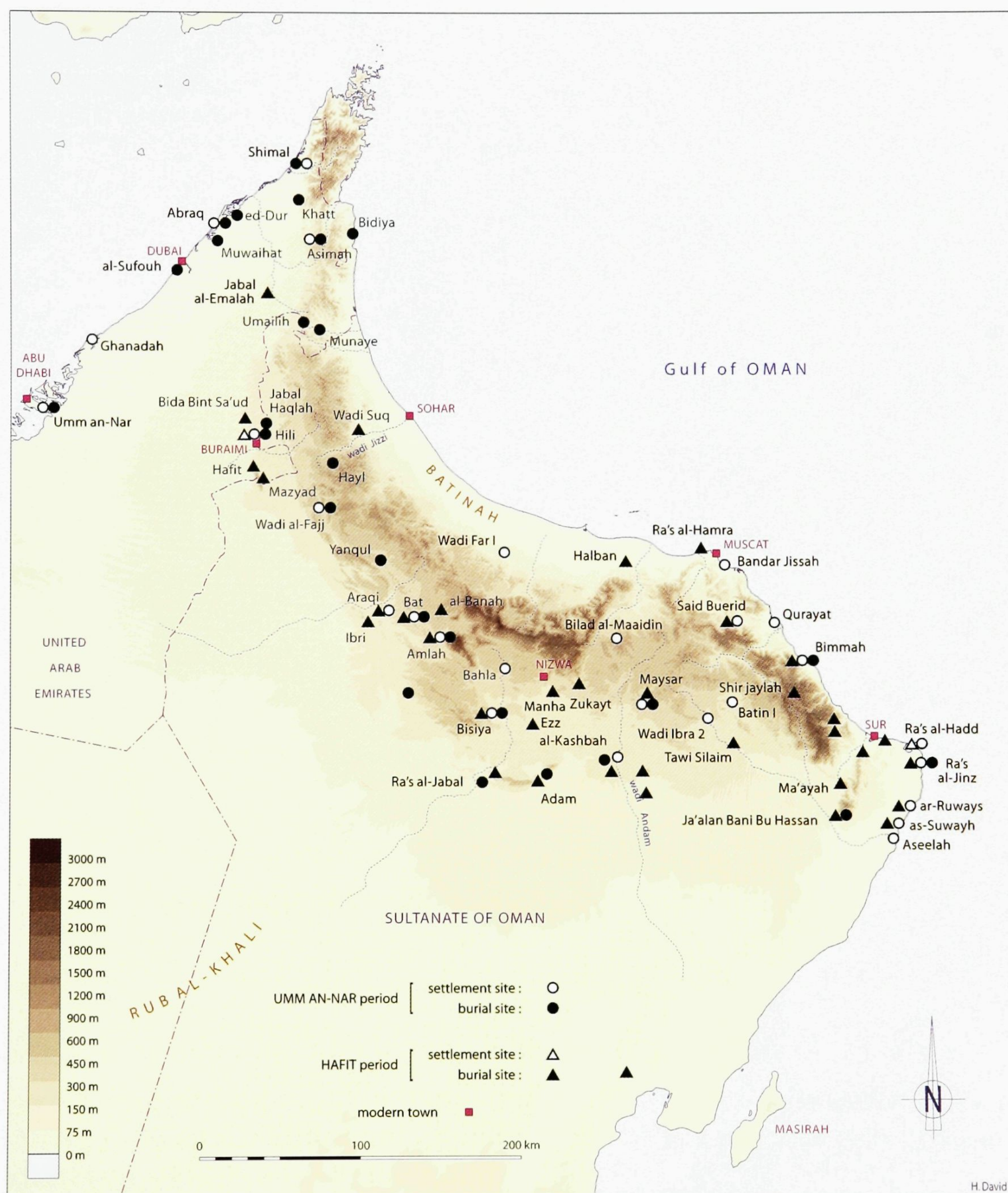


Figure 92: The main Early Bronze Age sites on the Oman peninsula. Again the map reveals that archaeological research in Eastern Arabia has concentrated on the oases of the interior piedmont plains from Ra's Al-Khaimah to the Ja'alan, while entire regions like the Batinah or the pre-desertic plains are still unexplored. The Bronze Age farmers, herders and fishermen during the third millennium BC occupied all the country. Their remains are everywhere with a density and magnitude higher than the current ones. This is evident where systematic surveys have been carried out on a regional scale (drawing by Hélène David).

Monuments called "cairn graves" by archaeologists are a familiar landmark on the Omani skyline. They are found almost all over the country, isolated or more commonly grouped on rocky ridges overlooking roads, oases and wadis. They can be seen on small isolated hillocks, at the foot of hills and buttes, on the edge of cliffs overlooking the sea, and on low terraces near it. Monuments in the same area may range from dozens to hundreds, and at a rough estimate they number more than 100,000 across the Sultanate (fig. 92). Their aspect varies, from the well-preserved tower-like monuments of Wadi Al-Shijar Jaylah (fig. 94), up to 8 metres high, standing at an altitude of 1800 metres on a remote plateau in the heart of the Hajjar mountains, to inconspicuous circles of stones produced by stone cutting from



Figure 93:
A series of well-preserved cairns on a crest in front of Jebel Misht (Wadi Ayn). They still overlook small cultivated fields. These cairns are registered on the World Heritage List (photo Serge Cleuziou).



Figure 94:
Grave 1 at Wadi Al-Shijar-Jaylah, 1800 m high in the eastern Hajjar Mountains, was found almost intact, although plundered. Its date can be fixed at around 2800 BC (photo Paul Yule).

more impressive constructions. Some have a door and some do not. Most are circular, others are oval, square or rectangular.

In Oman and the U.A.E., archaeologists commonly call these monuments "cairns" or "cairn burials", after the name given to them by Danish archaeologists in the sixties. This Celtic term means a "pile of stones" and in our case is fairly inappropriate, as the monuments are in fact built around an inner chamber. The term "turret graves", used for similar constructions in Yemen, is probably more suitable. Archaeologists do not hesitate to consider all these constructions as ground-level tombs, although their original function has often been forgotten by locals. In the Ja'alan, for instance, most people consider them as old storage devices for Bedouins or as gun shelters and gently smile at the archaeologist's conviction that they are very ancient graves. When he travelled across Oman in 1947, Wilfred Thesiger was told that these were just uninteresting piles of stones left by the ancients. It actually happened that such monuments were at times transformed into storage units or gun shelters. In mountainous areas

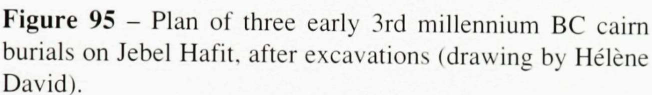


Figure 95 – Plan of three early 3rd millennium BC cairn burials on Jebel Hafit, after excavations (drawing by Hélène David).

some smaller round chambers with a rectangular door are also well known as wolf (or even lion) traps. But differences in construction or alteration in the original structures are clearly visible, at least to the experienced eye of an archaeologist.

The date of these monuments varies and they broadly cover a long time span, from ca. 3300 BC to the end of the first millennium BC. Archaeologists are, however, able to assign certain types of monuments to much shorter periods of time, according to their construction and to their contents, although care is necessary as they can have been re-used after long intervals. To find inside them an object dating from around 1000 BC, like the bronze sword recovered from a Jabal Hafit cairn by the Danish team in

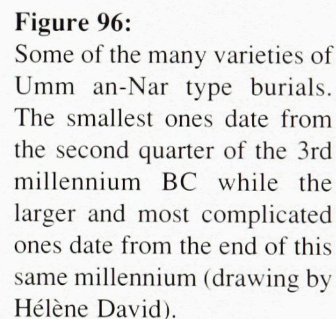


Figure 96:
Some of the many varieties of Umm an-Nar type burials. The smallest ones date from the second quarter of the 3rd millennium BC while the larger and most complicated ones date from the end of this same millennium (drawing by Hélène David).

Umm an-Nar island

Bat, grave 84

Bat, grave 55B

Umm an-Nar island

Bat, grave 53

Umm an-Nar island

Bat, grave 87

1 5 m

Hili North, Tomb A

Umm an-Nar island

the early sixties, or like the early second millennium BC spearhead found in cemetery RJ-43 near Ra's Al-Jinz, does not indicate that the monument itself was built and used at that same time. Through excavation results and the discovery of original inhumation remains inside the graves, it has been possible to identify a particular type of grave, often called a «Hafit type» cairn, and to assess for its construction and original use a date in the last centuries of the fourth millennium and the first half of the third millennium BC, that is, during the centuries of the great social transformation and its consolidation, contemporary with the development of oases and copper exploitation (chapter 6). Most of the cairn graves known in Oman actually belong to this period. All are circular tower-like monuments with a single chamber and a door facing east (fig. 95).

By 2700 BC, a new type of grave came in use, circular, divided into many chambers (fig. 96), and known by archaeologists as "Umm an-Nar type", after the name of a small coastal island near Abu Dhabi where they were first studied in the late fifties by the Danish archaeological team. This new type remained in use until the end of the third millennium BC. Such monuments are not very conspicuous, as they are usually located on a plain near the settlements, often damaged or buried under sediment, and therefore, unlike earlier ones, not usually visible from a distance. But, as will become evident later in this chapter, they must once have been quite impressive. The excavation and study of these two types of grave give insights of paramount importance into the Early Bronze Age society of Oman, its formation and consolidation, as well as its organisation and evolution.

A few cautionary statements should be made. As already seen in chapter 4, the study of the remains left by funerary customs may be a powerful tool for understanding various aspects of social and political life, and this is the case with third millennium BC Oman. It is a fact that many cultures tend to reproduce in their burials the status of the deceased, although in various ways and with many distortions of reality, so prehistorians have tended to think that the richer the burial and the more complicated the funerary customs, the higher the rank of whoever is buried. This allows them to identify, or to suggest, the presence of "chiefly" or "royal" graves and even the full range of social ranking in a given society. Egypt or Mesopotamia in the third millennium BC produce good examples of this. But it is not always the case. Many modern and ancient religions forbid the special treatment of dead bodies or restrict it. With some exceptions, high-ranking Muslim people are buried with no distinctive signs in non-distinctive simple graves, according to the precepts of



Figure 97:
The cairns in Wadi Ayn, as they appear from a distance. Everybody coming up the wadi could see them and understand that he was entering someone's territory (photo Serge Cleuziou).



Figure 98 – Detailed view of an early 3rd millennium cairn at Wadi Ayn, showing the construction using two concentric walls (photo Serge Cleuziou).

Islam, and this is true of some other religions as well. Moreover, not all funerary customs leave traces for the archaeologists, and poor remains may be all that result from complex and differentiated rituals. Let us take just one example. The Toradja people of Sulawesi place their dead in simple rectangular niches high in a cliff, and these niches, probably empty of bones, are all that will remain for archaeologists. But at the time of their deposition at the end of complex rituals, the bones were accompanied into these niches by wooden statues dressed in fine clothes that would for some time display the status of the deceased. The most important affirmation of status and power is, however, elsewhere. The corpses are transported to their last destination on a huge catafalque of wood, richly carved and painted, and pulled by many oxen, which is burnt in the ceremony while the animals are sacrificed and eaten during a large collective banquet. These huge festivals are the real social affirmation of wealth and power in this complex stratified society. They will obviously leave no trace, although a clever archaeologist may identify from fireplaces and ashes the remains of a banquet area, but, in the absence of other information, he will not be able to relate it to funerary rituals. Fortunately, however, the Early Bronze Age societies of Oman chose ways of burial that are still preserved in a state that conveys much information about their organisation. This can be recovered by archaeologists.

The Hafit Type Cairns: a Familiar Landmark of Oman.

Hafit type cairns are named after the place where they were first studied by a Danish archaeological team in the early sixties, south of the modern town of Al-Aïn in the U.A.E. All are circular monuments, ranging between four and seven metres in diameter at ground level. When well preserved, they appear



Figure 99: A typical cairn burial of the Hafit type at Bat (photo Serge Cleuziou).



Figure 100: A collection of beads found in cairn C3 on Jebel Hafit: 1 – two carnelian beads; 2 – three square spacers of heated steatite; 3 – small faïence beads; 4 – heated steatite microbeads; 5 – sawn Dentalium sp. shell; 6- pierced apexes of Conus sp. shells; 7 – square and rectangular plaques of mother of pearl; 8 – beads of Engina mendicaria shells. With the exception of the two carnelian beads, that are likely to be later and were found in the upper part of the filling, this assemblage is very characteristic of Hafit graves all over Oman.

as conical towers with a flat top, seen, for instance, at the Qubur Juhal site in Wadi Ayn (fig. 97). The eight metres of one of the tombs at Shir Jaylah may appear exceptional, but heights of four to six metres may have been quite common. The general outline of these constructions is remarkably similar all over the country and consists of two concentric circular walls delimiting a funerary chamber, circular, oval or squarish, that varies in diameter from 1.25 to 2 metres and is usually paved with flat slabs. They were made of undressed stones from local rocky formations and assembled without mortar (fig. 98, 99). The appearance of the monument depended on the type of materials available: rounded boulders in the ophiolite mountains, shapeless rubble or squarish brick-like stones closer to limestone formations. The latter, usually carefully selected, undoubtedly facilitated the work of the builders and produced the most impressive monuments, like those at Shihr Jaylah or Wadi Ayn. The interior wall was built with a carefully assembled inner and outer facing of selected stones arranged in regular courses separated by a filling of smaller blocks, while the outer wall, usually thinner, consisted only of an outer facing separated from the inner one by a filling of small blocks. In some cases a third wall was added, as for instance with some tombs at Tawi Silaim in the Sharqiyah. The chamber was roofed with corbelling stones and the top of the monument was flat. All monuments had an access corridor opening across the walls to the east through a narrow trapezoidal door, ca. 60 cm wide at ground level and one metre or less high. This entrance was blocked with unshaped stones.

Collective Burials for Whole Families.

Once excavated, the cairns are often found empty or with very few bones and objects inside. However, when their contents are preserved, they all appear as collective burials. Room was made for new corpses by pushing earlier skeletons against the walls, where long bones and skulls are often concentrated. The first excavations at Jabal Hafit uncovered only a few skeletons (up to three or four individuals), but more recent ones of better preserved graves at Ra's Al-Jinz and Ra's Al-Hadd in the Ja'alan show that up to thirty individuals could be buried in the same monument. These included males and females of all

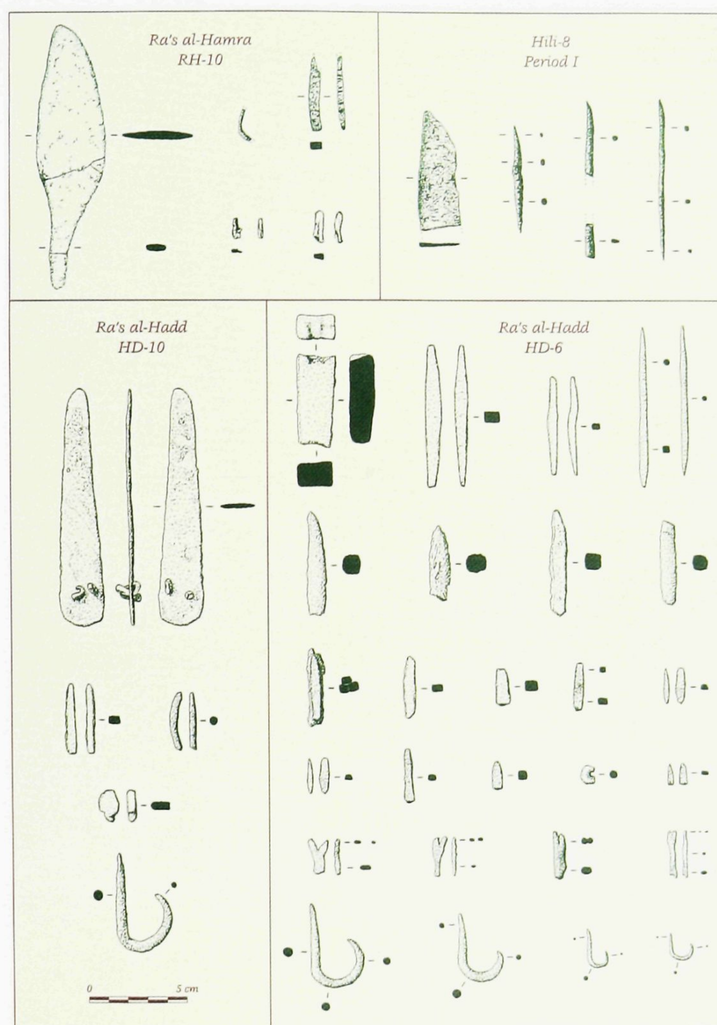
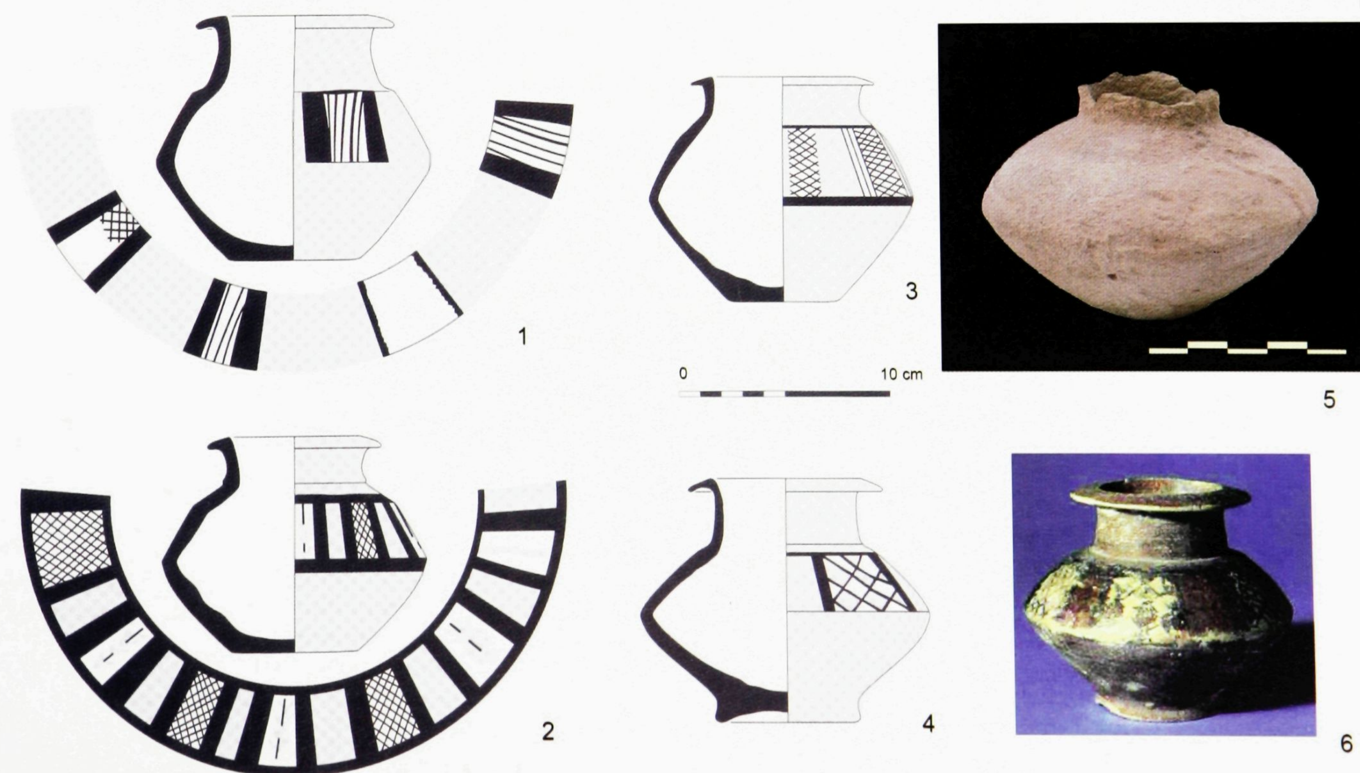


Figure 101:
Early copper tools in Oman. The knife from settlement Ra's Al-Hamra RH-10 dates from the late 4th millennium BC; the other items, from settlements Ra's Al-Hadd HD-6 and Hili 8, date from the very first centuries of the 3rd millennium BC, together with those of graveyard HD-10. The small dagger at HD-10 is a beautiful example of what was deposited in the graves, although usually only the rivets attaching such blades to their handle are found in many graves.

Figure 102:
Typical Jemdet Nasr small jars imported from Mesopotamia found in graves at Jebel Hafit and Buraimi (1-4, 6) and Zukayt (5) but also all over Oman (after various sources).



ages, adults, children and infants. It also appears that the graves were sealed after some period of use, and one can tentatively suggest that they were used throughout one or two centuries by family groups, each using one or several graves. When performed in the future, palaeogenetical analyses for DNA identification may verify the level of consanguinity among the buried skeletons.



Figure 103:
A typical item of Jemdat Nasr pottery in the ruins of a cairn at Zukayt (photo Joint Hadd Project).

Most of the graves were plundered in antiquity, but a few remains may help to reconstruct part of the rituals and furniture. The dead were probably first deposited on one side in a crouched position. Hundreds or thousands of small beads (fig. 100), some copper rings, awls and needles suggest that they were furnished with personal ornaments. A few copper rivets, from larger objects like daggers, such as the one found at Ra's Al-Hadd HD-10, indicate that some more important objects were occasionally deposited.

There are sometimes among the contents a few small pots, apparently never more than two or three, which have allowed us to establish the correct date of the monuments. These pots immediately attracted the interest of the archaeologists as they were identical in fabric, shape, size and decoration to some of those made in Mesopotamia around 3000 BC during the period called Jamdat Nasr (fig. 102, 103). This connection, later confirmed by radiocarbon measurements on the bones themselves, indicated that the graves could date back to the same period, a real surprise as no contemporary settlement was known at this early stage of archaeological research in Oman. Later chemical and petrographical analyses of the clays have unambiguously demonstrated that these pots were not local imitations but had all been imported from Mesopotamia. Apart from the date,



Figure 104:
A Hafit cairn burial after excavation at Ra's Al-Jinz RJ-6. Remains of 29 skeletons and the rim of a Jemdet Nasr type jar were found inside it, together with hundreds of beads (photo Joint Hadd Project).

the finds also indicated that the inhabitants of the Oman peninsula were already in contact with the distant country of Sumer and its powerful cities. The more recent discoveries of Ubaid painted pottery along the western coast of Oman have revealed that relations with Mesopotamia are in fact at least 2000 years older. However, the fact that the populations of Oman imported from Sumer pots that were only meant to accompany the ancestors in the graves is an indication of paramount importance for the society itself. These pots are found all over Oman, including in graveyard RJ-6 in Ra's Al-Jinz, the easternmost corner of Arabia and the most distant site from Mesopotamia. To deposit a specific type of foreign object in the graves was an important symbolic act for this society. It is probably quite meaningful that these objects were imported from the country where Omani mountain copper was now exported and in wide demand. These are objects of low intrinsic value, but in the new society emerging in Oman they were promoted as status symbols for the after-life, supporting the prestige connected with foreign exchange. There might have been many other objects but at least these have survived among the archaeological remains.

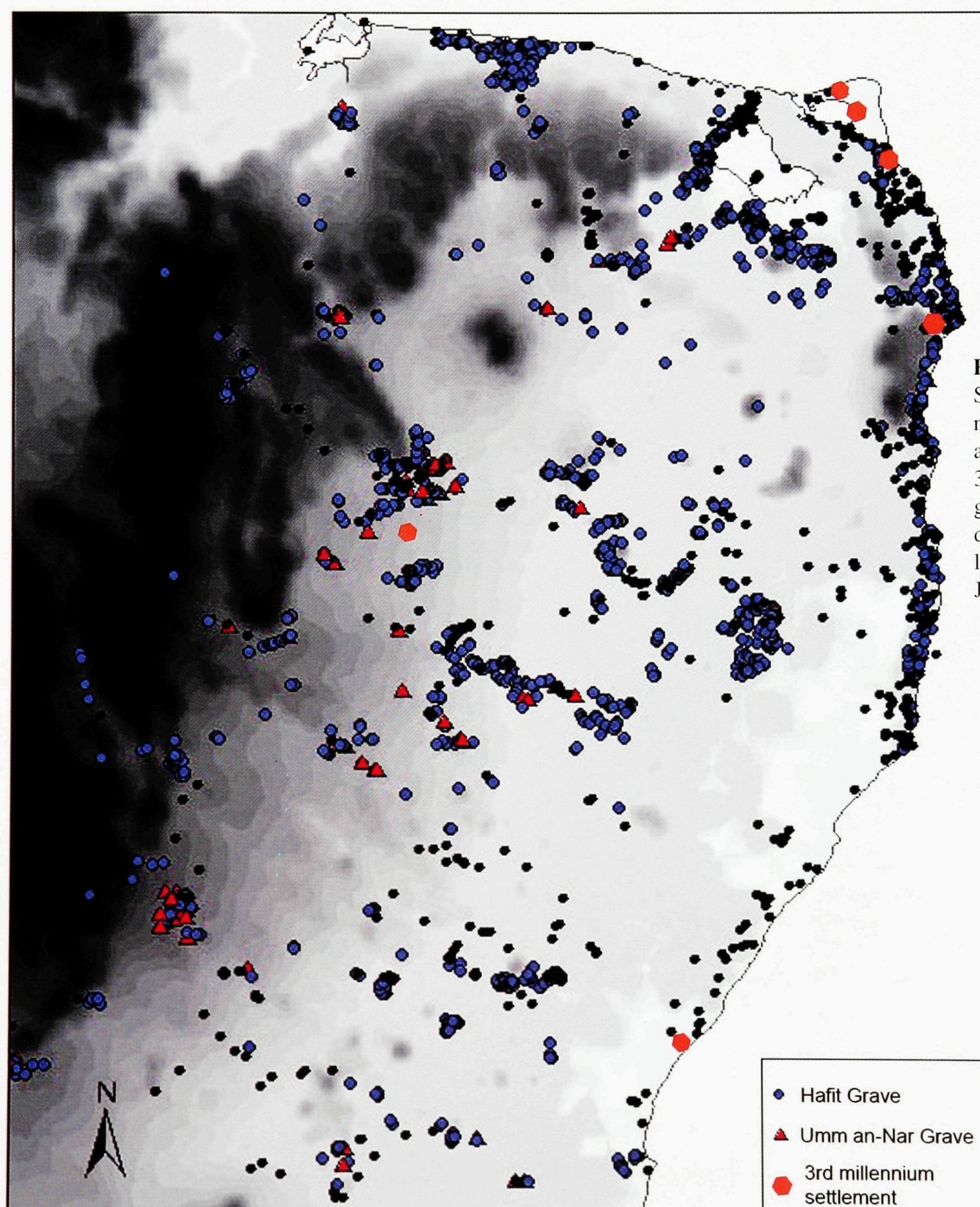


Figure 105:
Simplified archaeological map of the north-eastern area of Ja'alan during the 3rd millennium BC. It gives a good idea of how densely the area was populated (Joint Hadd Project / Jessica Giraud).



Figure 106 – Hafit type burials on top of Jebel Haqlah, Buraimi. This was the graveyard of the earliest period (period I) at site Hili 8 (photo Serge Cleuziou)..

Ancestors as Territorial Guardians.

The location of the monuments is another indicator of the changes that had occurred in the social order. The ancestors are no longer buried in the settlement sites as they were before, as at Al-Buhais or Ra's Al-Hamra. The graves are not only impressive monuments; they are also located in highly visible places around the newly-developed agricultural lands and near the resources communally exploited. Some 900 graves overlook the oasis settlement at Hili (fig. 106) and hundreds also that at Bat. Recent research in the Ja'alan suggests the organisation of a new society that started transforming the landscape, using graves as an indicator of territorial organisation. The total number of graves in this region is estimated at several thousand, most corresponding to the agricultural areas near the present oases of Al-Kamil, Ja'alan Bani bu Hasan, and Ja'alan Bani bu Ali, while about 3000 have been identified in the eastern part of the region, corresponding to the steppe and coastal environments. Random test excavations of graves from various groups have all concluded that the graves must be dated to the late fourth or early third millennium BC and in any case before 2500 BC - at least for what concerns their construction and original use. They can therefore be



Figure 107:
A group of Hafit type graves overlooking a beach south of Ra's Al-Jinz (RJ-47). Their presence probably indicates fishing rights on the beach itself, a typical example of how the territory was taken over by local communities (photo Joint Hadd Project).

Figure 108:
An almost intact cairn burial, high over Wadi Bani Jabir, Eastern Hajjar. It is alone on a summit but can be seen from far away, while from its location, other similar tombs can be seen in the distance. We interpret them as territorial markers as well as graves.





Figure 109:
One of the many cairn burials at Zukayt, overlooking the narrow pass between Izki and Sinaw. We may hypothesize that it was a landmark for both the pass and the oasis (photo Joint Hadd Project).

used as a kind of "photograph" of Omani territorial organisation at the beginning of the Early Bronze Age. They also allow some insights into the society that emerged from the Great Transformation.

Cemeteries in the Ja'alan vary in size from several hundred graves to isolated monuments and a careful study of their distribution leads us to recognise various types of burial ground. The largest groups, comprising over 200 monuments, are located near known settlements like Ra's Al-Jinz or Ra's Shiya, or settlements that are likely still to be found such as at Jaramah or Mellahi on the inner side of a shallow fossil lagoon that once extended west of Ra's al-Khabbah (fig. 105). These tombs are located on the edge of terraces, on the crest of ridges, and at the foot of hills overlooking the settlement areas. They are distributed in groups that partly relate to the topography or, as indicated by the smaller cemetery of HD-10 above the HD-6 settlement at Ra's al-Hadd, in clusters that may be associated with family



Figure 110:
Tomb M, an early Umm an-Nar tomb at Hili (ca. 2700-2500 BC). The careful facing of "sugar lump" stones, the trapezoidal northern door and the plinth are clearly visible (photo French Archaeological Mission to Abu Dhabi).

groups or larger social segments. The presence of an ancestral burial place constituted a claim to the ownership of lands that were only seasonally occupied, most probably between October and March when fishing was allowed by the monsoon. Clearly such was also the function of burials around oases of the interior, although by 3000 BC these farmlands were permanently settled. It was a new way of using and appropriating territory and everybody felt the need to claim it for ancient uses. The ancestors guaranteed ownership of the area that had been developed through communal work and their presence legitimised priority of access to this resource.

It is therefore not surprising to see smaller groups of graves associated with any resource areas. In the Ja'alan, all the beaches that could be used for fishing were clearly "marked" by groups of graves that can be understood as a legitimisation of exclusive or shared access to the fishing grounds (fig. 107). The same is true for areas where pasture land was available to herders, most especially where water was easily accessible, in small ponds remaining after the



Figure 111 – An excavated mid-3rd millennium BC Umm an-Nar type tomb at Bat (photo Jürgen Christian Meyer).



Figure 112:
Well preserved mid-3rd millennium Umm an-Nar tombs at Bat. Note the carefully set outer wall of "sugar-lump" stones to the left (photo Jürgen Christian Meyer).



Figure 113:
A mid-3rd millennium Umm an-Nar tomb at Bat. The small trench across the debris in front of the grave has exposed the careful facing of white limestone "sugar-lump" stones that were brought from some 30 kilometres away (photo Jürgen Christian Meyer).

winter rains or through holes dug in wadi floor to reach the shallow water table, never more than a metre or two below the surface. These are found everywhere and indicate a complete occupation of the region and all its resources already by the early third millennium BC.

It is still too early to estimate the population of the Ja'alan at that time, although one can certainly assume that it was greater than in earlier periods. This is evident from the number of graves, at least from the best preserved ones, and the number of individuals they contained. In such conditions, property and conflicts over the use of places and resources among various groups must have been unavoidable. At least some groups of tombs must have been linked to delimitation of territory rather than to appropriation of resources. This is particularly evident in places where the topography leads to a natural delimitation of the land, like the Ma'ayah pass along the modern asphalt road linking Al-



Figure 114 – One of the oldest Umm an-Nar tombs excavated at Hili (ca. 2800-2600 BC). It was almost fully destroyed, but one "sugar-lump" stone remains from the facing wall and some slabs from the paving of the chambers as well as the base of the dividing walls (photo French Archaeological Mission to Abu Dhabi).

Kamil to Sur. There, the traveller leaving Wadi Al-Batha and its chain of oases has to cross through cemetery fields on the southern side of the pass, while they are significantly absent on the northern side. Only some kilometres north are found the first of several small groups of tombs on the edge of terraces along small wadis that merge to form the well-watered Wadi Fulayj before it reaches Sur with its rich agricultural lands and fishing grounds. Such "frontier graveyards" are not always so easy to determine, but they can often be found along the passes between the main wadis or on smaller features of the landscape that may have been used to delimit early territories, like the watch towers that marked territorial boundaries during the recent history of Oman. The most spectacular graves of Oman, at Shihr-Jaylah, are located at an altitude of ca. 1700 m on the edge of a small plateau that separates Wadi Tiwi, running towards the Indian Ocean,

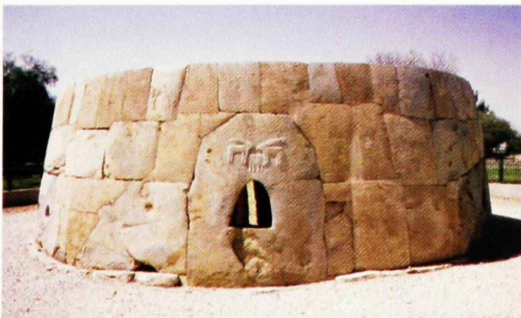


Figure 115 – Tomb 1059 at Hili. It was restored using the original stones. This view from the south displays the huge southern door-slab, ca. 2.2 m high and several tons in weight, with low relief engravings (photo French Archaeological Mission to Abu Dhabi).



Figure 116 – An Umm an-Nar facing slab with a gutter on the top at Bat (top) and another one at Hili (below). These were probably at the junction between the flat roof and the façade wall, allowing water to pour from the top. Some archaeologists would, however, like to interpret them in a less mundane way as "altars" for any kind of ritual including the use of liquids (photos joint Hadd project and French Archaeological Mission to Abu Dhabi).

from Wadi Khabbah, that flows towards the interior. They might be interpreted in this same way as borderline towers. This would account for their presence in such a remote area but would also attest to the importance given by Oman's Early Bronze Age society to the control of the mountain crests and the most evident delimitation of their territories. In the Ja'alan, graveyards such as RJ-27 and RJ-31 at Ra's Al-Jinz are a good example of what these "frontier graveyards" could be. These two clusters of cairns



Figure 117 – Tomb A at Hili North. Only the subterranean chambers of the tomb are preserved. Compartment 4 (left) was found empty, while compartment 3 still contained the remains of 31 individuals. Excavations have shown that a complex series of events took place at this grave, until it was voluntarily destroyed around 2100 BC (photo French Archaeological Mission to Abu Dhabi).

occupy two low passes connecting the settlement area with the hinterland. Each consisted of some two dozen graves, of which several were on the inner slope facing the settlement and some directly formed a line on the low saddle that forms the pass. Nowadays, most of these are seriously damaged and cannot be seen from a distance; but in Early Bronze Age times anybody approaching from the interior could have seen a "wall" of 4-6 metres high tower graves, very impressive when viewed from below. Nobody, friend or foe, could ignore the fact that he had entered the territory of the Ra's Al-Jinz community. More graveyards along the small Wadi Salil that leads to the embayment, like RJ-43 and RJ-29, were there to remind him again before he entered the settled area.

A similar or related interpretation can be given to isolated monuments, high on a promontory and rather difficult to reach. They can be considered as a kind of signal visible from afar. This becomes particularly obvious in the mountain areas, for instance in the steep valleys south of Qalhat where several isolated monuments have survived on peaks, 1000 metres or more high, at a great distance from any known or possible settlement (fig. 108). Due to access difficulties, they are often better preserved although they are usually found empty. Each can be seen from far away in the mountains but also from other similar monuments located at a distance of ten kilometres or more. Here again, this is a clear indication that the ancestors were utilised to appropriate



Figure 118:
A row of raised slabs surrounded tomb A at Hili North, indicating that the Umm an-Nar type burials were surrounded by various structures involved in diverse rituals around and probably inside the graves (photo French Archaeological Mission to Abu Dhabi).



Figure 119:
A close-up view of the skeletons in compartment 3 at Hili North, tomb A. The corpses are deposited in a flexed position, characteristic of all the Umm an-Nar type burials. Note the many complete vessels found deposited with the bodies (photo French Archaeological Mission to Abu Dhabi).



Figure 120 – The skeletons in compartment 3 at Hili North, tomb A, with various offerings (mainly pottery vessels). The fact that paving stone slabs under the skeletons are partly disturbed is a clear indication that they were deposited after an already long period of use. This was obviously the primary deposition of the corpses that were later "processed" through various rituals, once the flesh was gone (photo French Archaeological Mission to Abu Dhabi).

the landscape. It also indicates that almost no part of the landscape was left empty and that all available resources had been appropriated by clans and tribal groups. The tower graves had turned the natural landscape into a political one.

Considering the number of early 3rd millennium cairn graves already known - 100,000 is, according to us, a low estimate - we can confidently assume that at this date all of Oman was settled, including coastal areas, piedmonts and deep valleys in the mountains, and was already divided into political and economic territories. This contrasts with the few settlement sites known from the same period, but may be due only to the much better visibility of the tombs. It should come as no surprise if, as already demonstrated, this visibility was intentional.

Another and important fact is that collective burials are now the rule for all members of the new society, with some exceptions for children, however, as evidenced by two burials of new-born babies recently found in contemporary settlement contexts at Ra's al-Jinz site RJ-1. Family bonds and kinship relations are given priority in placing the dead, probably to affirm that such should also be the rule among the living. Collective graves convey the image of an egalitarian society. All members are equal. Or at least they do not keep in the afterlife signs of the status they may have enjoyed during their temporary earthly life. The tombs group together all related kin and all members of their larger community in an ostentatious affirmation of its unity and its relationship to the territory. In better known ancient societies, such death rituals may in fact be used to deny social tensions among the living, as was certainly



Figure 121: Tomb 1 at Ra's Al-Jinz RJ-1 (mid 3rd millennium BC). Beside the tomb (background left) are three elongated pits, possibly inside a circular precinct (foreground), that were filled with bones removed from the main grave. A few bones are still in the position they were found in during the excavation process (photo Joint Hadd Project).



Figure 122:
Bahla: a rectangular pit cut in the rock was found full of bones and late 3rd millennium items below the wall of the 13th century AD mosque near the castle. It was probably a bone pit associated with a nearby Umm an-Nar type tomb, a testimony to the long history of the Bahla oasis and town (photo Joint Hadd Project).



Figure 123:
Skulls and bundles of long limb bones in the northern part of one of the pits outside tomb 1 at Ra's Al-Jinz RJ-1 (photo Joint Hadd Project).

the case with the introduction of new techniques, new professions, new economic relations, and the definition of new territories by the end of the fourth millennium BC. Rituality is always a privileged way of expressing and resolving such tensions. In the same period, for instance, the hunter-gatherers and fishing communities of Denmark, beginning like Omani communities to adopt agriculture and animal husbandry, developed complex funerary rituals and built impressive monuments. This may tell us that jural equality and kinship relationships remained the basis of Early Bronze Age Omani society, unlike what had happened previously in other parts of the oriental world, in Egypt, Syria or Mesopotamia. Social relations inherited from the previous hunter-gatherers were strong enough to resist destabilisation coming from abroad.

Given the increasing importance of regional exchanges the Hafit turret graves were also placed to signal incoming parties from quite a distance tribal control of critical passages and intersections along the highways of transport and migration. One of the best preserved examples of the kind in northern Oman are aligned on the hill crests overlooking the small oasis of Zukayt, only 15 km south of Izki

along the wadi Sumayl corridor, the wide tectonic fault cutting across the Al-Hajar mountains, between the Jebel Akhdar massive and the Sharqiyah, to connect the two sides of the country. The gardens of Zukayt grew at the foot of Jebel Safra, an easternmost limestone extension of the Jebel Akhdar that reduces the passage to a narrow bottleneck of 3-4 km. Hundreds of turret-like Hafit graves still crenellate the crests in all directions controlling every viewpoints just like small watch towers (fig. 109). The ancestors are still there, since five thousand years, sleepless guardians of the Magan tribes that had long disappeared from the memory of mankind. An impressively more real Ozymandias, that while overcoming the imaginary of the greatest poet, recalls us all that in its deepest motion archaeology more than a science would be a way to fight oblivion and ultimately death.



Figure 124: One of the pits outside tomb 1, from the south. In the foreground is a heap of at least 28 skulls, partly destroyed as they were found directly below the surface of the site, itself highly eroded by wind and later human activities (photo Joint Hadd Project).



Figure 125 – A late 3rd millennium BC Umm an-Nar type tomb at Al-Moyassar. This small tomb had two subterranean chambers covered by large flat slabs. Human remains were found both on these slabs and in the shallow subterranean chambers (photo German Mining Museum, Bochum).

The "Umm an-Nar" Type Tombs.

By 2700 BC a new type of burial appears, employing what archaeologists call "Umm an-Nar" graves, that will be in use until 2000 BC. They display during this timespan an evolution towards a larger size and more monumental aspect, making room for even more dead members of the community, and apparently using increasingly sophisticated rituals. This is highly significant for the society as a whole. These new graves still represent burials, but their location is different, closer now to the settlements still dominated by the former "Hafit graves", where the older ancestors maintain their role as guardians of the by now well- established territorial order of tribal divisions.



Figure 126 – The subterranean part of a large Umm an-Nar grave found at Bisiya. It had two rows of four chambers on both sides of a north-south corridor, and was accessible by stairs from its northern part (photo Serge Cleuziou).

As before, examples of this new type of monument are found all over Oman, with a remarkable unity in plan, aspect, construction techniques and contents. Although larger in diameter, they are not so tall as the Hafit cairns, their maximum known height being slightly above three metres. They contain several funerary chambers. With a few exceptions, they are entered through two doors in the carefully dressed stones of the outer wall. These doors open some fifty centimetres above the ground and never at ground level as was previously the case (fig. 96). At the base of the wall is a slightly protruding plinth of flat slabs - here again a new feature that can be observed throughout Oman (fig 110, 111, 114, 115). The presence of such a plinth on a heavily damaged monument is enough to identify it as an "Umm an-Nar" grave. Due to their position on a plain near settlements, they are usually not so easily noticed as the previous "Hafit" type cairns. They can be covered by small sand dunes, and in any case have been much more affected by land developments since Early Bronze Age times, damaged, or even buried under heaps of earth accumulated in history. Their nice facing stones or large worked slabs have been recycled since antiquity for building purposes and can be found in later constructions, from the Early Bronze Age to modern times. This partly explains the fact that far fewer "Umm an-Nar" tombs are known than "Hafit" tombs, although they broadly cover a similar, even slightly longer, timespan of several hundred years. At a rough estimate, we may assume that about a hundred have been found in the Sultanate of Oman, and almost as many in the United Arab Emirates. We will see later that there are good reasons to consider that these figures are not only a result of less visibility and lower preservation. Anticipating their interpretation, we can say that many fewer tombs were built and that they contained far more people in a different way.

A New Place for the Ancestors.

In Oman the largest known Early Bronze Age cemetery is at Bat (fig. 111-113). It includes some twelve excavated or tested "Umm an-Nar" tombs and fourrty is probably a maximum estimate for the total number of such monuments. The general map of Bat is illustrative of the situation, with a large number of "Hafit" type burials on crests to the north of the oasis or at its foot and "Umm an-Nar" tombs on the plain at a short distance from the settlement buildings (fig. 141). The excavated graves had unfortunately been plundered in antiquity, and one can only say that they covered the complete timespan from 2700 to 2000 BC. A similar situation is found at Hili where the earlier graves are located on Jabal Haqlah, two kilometres to the east, while the



Figure 127 – Some of the more than 12,500 beads found in grave 1 and the associated bone pits at Ra's Al-Jinz. These include faience (1), small barrel-shaped (4) and discoid (10) beads of heated steatite, fish vertebrae (2), carnelian beads (9, 13), steatite beads (3, 8, 11), shell beads (5, 6), and four tiny golden beads (12), represented here as twice their size (photo Joint Hadd Project).

"Umm an-Nar" graves are located immediately to the west of the settled area or even inside it (fig. 142). Ten have been excavated and a similar number are likely to be still covered by small sand dunes. At Umm an-Nar, graves of types both ancient and new are located on a low plateau near the settlement, but it is noteworthy that the "Umm an-Nar" tombs, and especially the largest of them, are closer than the earlier ones, just on the rim of the plateau. In Oman, other graves of this type have been excavated near Hayl in Wadi Jizzi, at Amlah, and at Al-Moyassar. Some remains are also known at Selme near Ibri. Graves still to be excavated, some of them apparently in good condition, are known at Wadi Al-Fajj, Yanqul, Wadi Ayn, and several other places in the mountainous areas of the interior, near Bahla and Bisya in the piedmonts, at Bimmah on the coast, and on the northern fringes of the city of Ja'alan Bani bu Hassan. Many others remain to be discovered. At Limwelaha 1 in the Bisyah area, excavation of a small two-chambered grave yielded only a few skeletons with a rich furnishing of copper tools or weapons and a stone stamp seal, the first ever found in an Omani tomb. A second one has since been found at Hili N in the UAE). These objects date from the very end of the third millennium BC. In the Ja'alan steppe, several graves are known at the edge of gravel terraces, overlooking wells or possibly restricted farmlands, but remain unexcavated. At Ra's Al-Jinz, two groups of tombs dominate the seasonal fishermen's village, one (RJ-11) located on the Ra's Al-Jinz cape itself above site RJ-3 and the other



Figure 128 – Four carnelian beads imported from the Indus valley at Hili North grave A (ca. 2300-2200 BC). The decorated ones in the centre are of an etched carnelian type exclusively made in the Indus, most probably at Lothal in Gujerat (photo French Archaeological Mission to Abu Dhabi).

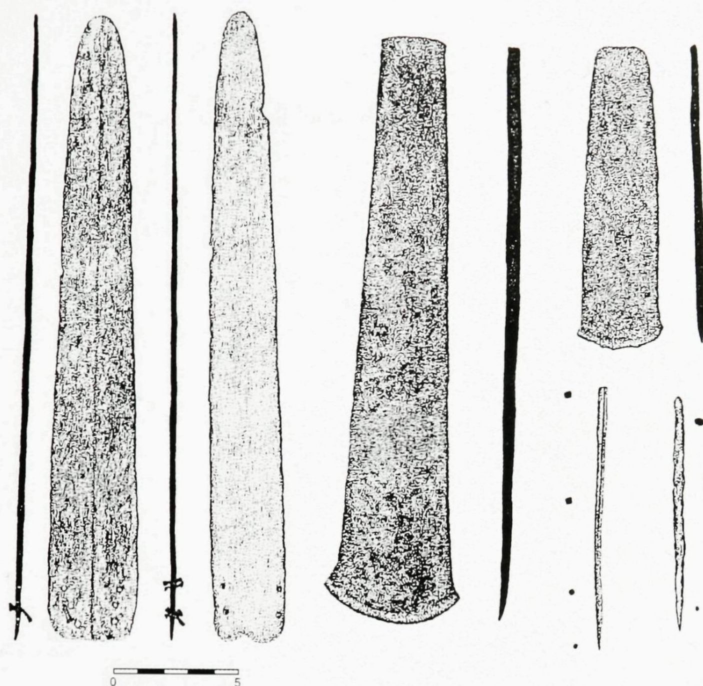


Figure 129:
Mid-3rd millennium copper tools from an Umm an-Nar tomb at Al-Sufouh near Dubai. They are illustrative of the copper items made in Magan during the 3rd millennium BC. (after Benton 1996).

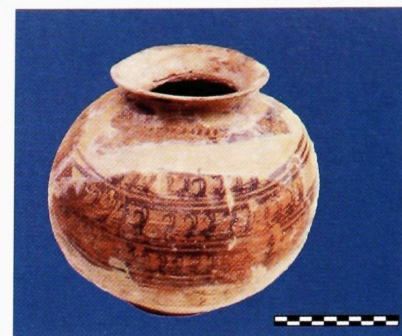


Figure 130 – A red vessel with a black painted decoration of stylized caprid heads, of south-east Iranian origin, found in grave M at Hili, dated ca. 2800-2600 BC (photo French Archaeological Mission to Abu Dhabi).

(RJ-1) above the excavated remains of houses from the second part of the 3rd millennium BC at RJ-2 (fig. 242). There are five graves at RJ-11 and six at RJ-1, and one has been excavated on both sites. Tomb 4 of RJ-11 was very poorly preserved while tomb 1 at RJ-1, although destroyed in antiquity and its stones re-used to build a house during the Wadi Suq period, turned out to be eight metres in diameter and divided into eight chambers (fig. 121, see also window 5). With the exception of Bat and Ra's Al-Jinz, our information on these graves and their rituals comes mainly from excavations in the United Arab Emirates such as at Umm an-Nar, Hili, Al-Sufouh (Dubai), Mowaihat (Sharjah), Abraq (Umm Al-Qawayn), and Munaie (Ra's Al-Khaimah), but the data gathered in Oman allow us to generalise this information for the whole region.

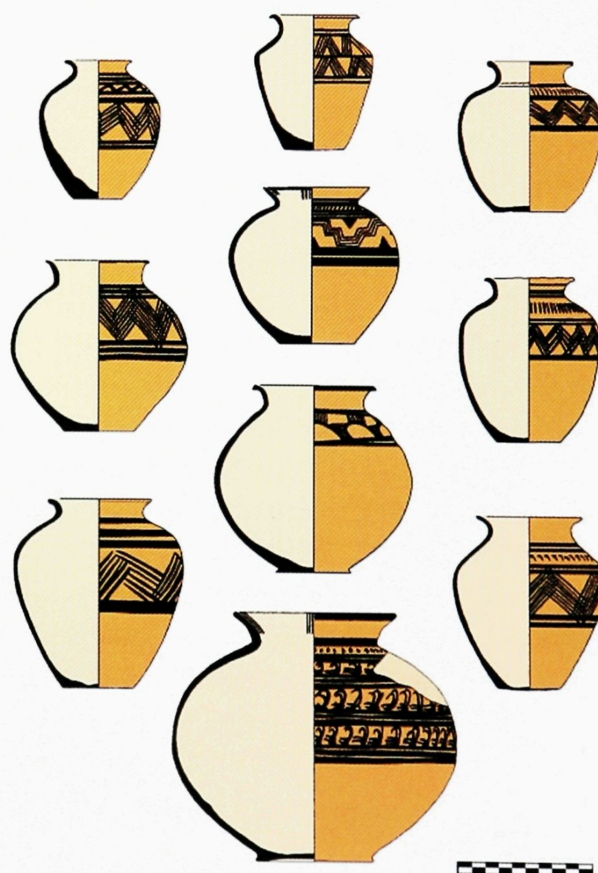


Figure 131:
A selection of black on red painted vessels of fine ware deposited in Umm an-Nar graves (drawing by Hélène David).

The tombs are now larger and divided into several chambers in order to house many more bodies. Their size and capacity increase through time and their general aspect becomes ever more monumental. The earlier ones are divided into two semi-circular chambers by an internal wall and have only one



Figure 132 – Painted and incised grey ware from tomb A at Hili North, ca. 2300-2100 BC. The incised vessel to the left has been revealed by chemical analysis as being a copy of Iranian pottery made locally; the three others originate from south-eastern Iran (photo French Archaeological Mission to Abu Dhabi).

door, like tomb 1054 at Bat, but soon the monuments are divided into two non-communicating halves, each with its own access door. The general shape of the doors is trapezoidal and they open some fifty centimetres above the plinth. These doors are quite small, never more than 60-70 centimetres high and 60 centimetres wide at the bottom (fig. 112, 114). They were usually closed by three specially shaped stones, two at the bottom and one in the upper part, and provided with a handle to facilitate successive openings. Such doors have been found at Hili and Umm an-Nar. From 7-8 metres at the beginning, the diameter reaches 10-12 metres by the end of the 3rd millennium BC, the largest known monument at Shima'l in the Emirate of Ra's Al-Khaimah being even 14 metres in diameter. At Hili and Umm an-Nar there is evidence that at least some of the most recent and monumental graves were two-storeyed

The inner walls of the monuments were built of large blocks of undressed stone assembled without mortar; and so was the circular outer wall, except for its facing that was made of specially shaped stones carefully assembled. At Bat, for instance, it was built of rectangular blocks of white limestone imported from a distant quarry, in contrast with the locally available reddish limestone of the inner walls (fig. 113). The outer face of these stones was very carefully worked by hammering and gently curved to perfectly follow the line of the wall, while their cutting edges were precisely shaped to fit tightly with the other stones. The effect was beautiful. This "sugar lump stone" facing, as it is often called, characterises the earlier graves until 2500-2400 BC at Bat (fig. 112), Amlah, Hili (fig. 111) and Umm an-Nar. It is progressively replaced by the use of larger slabs, up to a metre long at most, vertically set to make a more impressive facing, and specially dressed to remain tightly jointed. In some of the most recent graves, like tomb 1051 at Hili or tomb A at Hili north, the builders even used huge orthostats weighing several tons each, still very carefully assembled and giving to the monument the aspect of the «Cyclopean walls» of early Greek architecture (fig. 114). On both monuments the doors were cut through large single slabs. At Hili 1051, the southern door was 1.80 metres wide and 2.50 metres high (fig. 114) while the northern one, narrower (1.40 metres), was also the tallest known,

at 2.90 metres (fig. 257). In some cases, like cairn II at Umm an-Nar and tomb 1051 at Hili, some of these slabs were adorned with engravings that are among the very few elements to give us some indication of the ideology of Oman's Early Bronze Age civilisation. The chambers were paved with large flat stones, and if the monument had two storeys, other large flat stones were used to make the floor of the second storey. None of the excavated graves has been preserved up to its top, but several indications suggest that the inner walls, wider towards the top, were capped by large flat slabs. Another indication that the top may have been flat is the presence of specially shaped gutters among the ruins of several monuments at Hili, Mleiha or Bat, obviously placed on top of the outer facing to drain rain-water from the roof (fig. 116). Generally speaking, both according to their size and the way they were made, the "Umm an-Nar type" tombs represent a much greater investment than the "Hafit type" and are technically much more sophisticated, necessitating for their construction the involvement of a far larger community.

The Ancestors as a Single Community of Equals.

Most of the monuments have been found to be heavily damaged and have yielded only a few objects and bone splinters. There are, however, a few exceptions, like tomb II at Umm an-Nar or tomb A at Hili north, although even these are far from intact. Tomb II at Umm an-Nar, dating from 2400-2300 BC, yielded at least 34 skeletons, tomb II at Al-Sufouh, dating from 2600-2400, yielded 57 skeletons, and tomb A at Hili North (fig. 117), dating from 2300-2100 BC, yielded the remains of at least 300 individuals. So did the tomb excavated at Al-Abraq, dating from 2200-2000 BC. In all tombs the skeletons were found lying on their right side or, less frequently, on their left side. The knees were sharply bent and the legs formed an almost right angle with the body, while the hands were raised to the face (fig. 119). In either half or compartment of the tombs were found males and females, children, adults and elders without distinction, and we can be sure that at least sex and age were not a main factor of division among the dead inside a single monument. It is most likely that they were deposited in a particular half or a particular compartment according to family affiliation. Anthropological studies at Umm an-Nar suggest this and it may be demonstrated by genetic studies in the future. We know, however, from the excavations of buildings I and II at Ra's Al-Jinz RJ-2 (ca. 2500-2300 BC) that at least some of the new-born children were not buried in these monuments, as five of them were found buried in pots or in shallow pits under the floors of the houses. Archaeologists would usually assume from such occurrences that younger infants were not buried in the collective graves because they were not yet considered as part of the community. The presence of children of the same age at Hili north, however, suggests that this may be casual as well, or more probably dependent on other rules.

The corpses were laid in the funerary chambers with personal ornaments: necklaces, bracelets of beads, copper pins, copper finger and ear-rings, as well as tools and weapons. Many offerings were also found, mainly vessels of pottery and stone with their now lost contents that cannot be associated with a particular individual. Some were buried with rich personal ornaments, like the gold "diadem" at Umm an-Nar and the beautiful necklaces of carnelian and silver beads at Hili and RJ-1. The latter also yielded three small gold beads, probably the remnants of a complete necklace and fancy carved ivory combs emerged at Al-Abraq. Although none of the dead was given any differentiated treatment at this time, we can assume from these particular items that, when entering the monument, individuals still kept the status that they had enjoyed (or suffered) during lifetime.

But this was only a first step in the after-life process. Only 31 individuals were found in primary deposition at Hili north A, buried in sequence side by side with their associated personal items and offerings (fig. 117). This only represents 1/10th of the minimum number of people found inside the monument according to the examination of thousands of bones by palaeoanthropologists. Except those, all the other bones were found in secondary

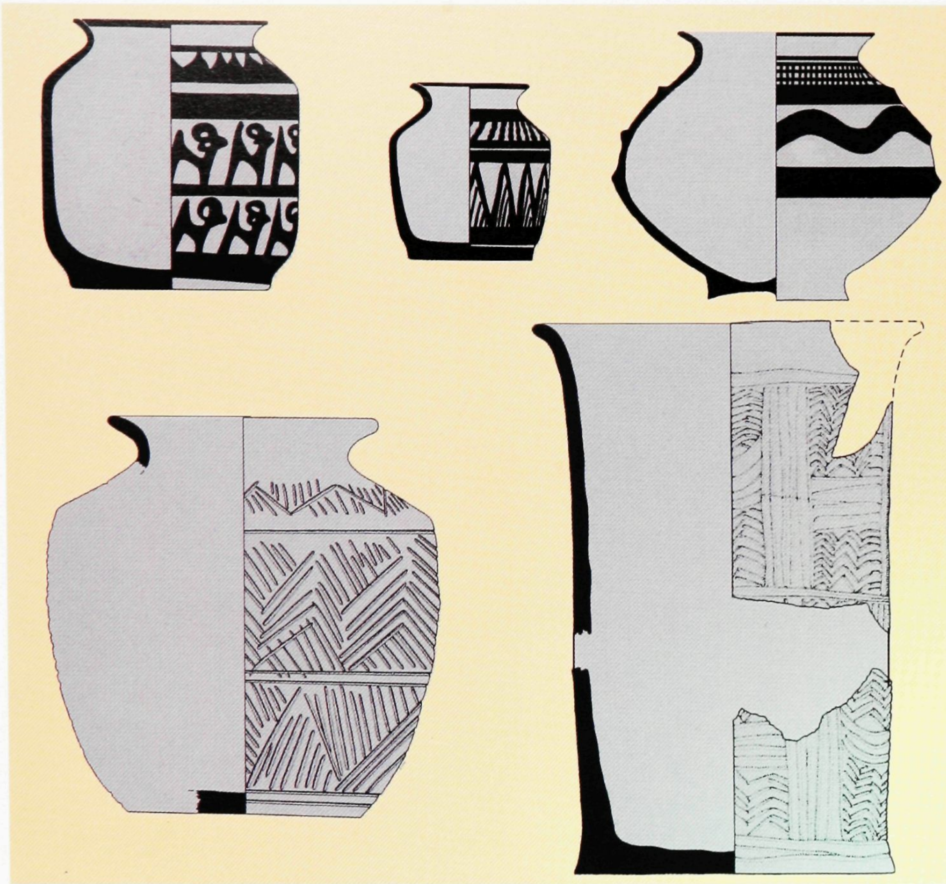


Figure 133:
Painted and incised grey ware of south-eastern Iranian origin from the tombs at Umm an-Nar, mid-3rd millennium BC (drawing by Hélène David).

position, as piles of skulls near the walls or as highly burnt bone fragments that appear to have fallen from the upper part of the monument (fig. 120). It is most likely that, periodically, once the flesh was totally or mostly gone, skeletons were removed from their original position, dismembered, and part of them and their offerings at some time intentionally burnt. We can, therefore, suppose that the number of skeletons found inside the monument is only a fraction of those it had once housed, which might have numbered up to a thousand. Excavations around some of the monuments have uncovered large pits where burnt and unburnt bones were disposed of together with offerings and individual ornaments now clearly separated from any particular skeleton. At Al Sufouh (Dubai) and Ra's Al-Jinz RJ-1, around 2500-2400 BC, these were only shallow pits (fig. 121, 137), while at Mowaihat (Sharjah) and Hili N they were large stone-lined subterranean chambers. A late 3rd millennium rectangular pit dug in rock and full of bones and items was recently found at Bahla covered by the eastern wall of the 12th century mosque (fig. 122). Hili N is particularly impressive and estimates of the number of individuals found in it range between 500 and 1000. Inside the pit were fully disconnected and broken bones, but also skeletons still partly intact. There were bones burnt by fires lit inside the pit and a few complete corpses directly buried there. In one of the three pits associated with tomb 1 at RJ-1 was a heap of 28 skulls (fig. 124) b. This suggests the complexity of the rituals that we are trying to summarise. Through this process all individuals became associated together in the undifferentiated community of the ancestors. Available data only tell us that such rituals did exist, and a better understanding of them would need painstaking and time-consuming excavation of well-preserved contexts. It would also require the combined work of several specialists for many months and a large number of analyses of several thousand bones. For the time being, we can, however, interpret the tombs as "machines" to process the dead members of a large kin-based group and progressively to mingle their physical remains with such a community, whatever their previous status among the living. From this perspective, it is interesting to note that some graves are likely to have been voluntarily "closed" or even destroyed. Among the early ones, tomb M at Hili, used around 2700-2500 BC, was found almost empty. Apart

from fragments of 33 vessels and 1916 small beads recovered from between the slabs paving what remained of the floor, it yielded only a few badly decayed bone splinters. All but one of the attractive sugar-lump stones that once formed its elegant outer facing had been plundered (fig. 115), and are likely to be among those found re-used in the nearby settlement at Hili 8. The area was later transformed into a craft workshop. On the same site, the large pit named as tomb N and already described may have been connected with nearby tomb J. This was also the case with tomb 1 at RJ-1, whose remains seem to have been filled with the same reddish clay that was used to make the mud-bricks of the houses, while some of the bones were buried nearby in three shallow pits. The same can be said of the contemporaneous grave at Al-Sufouh near Dubai. We may even suppose that on such occasions the most precious or interesting objects were recovered, and this may be why tools and weapons are rare - or why only four gold beads remained at RJ-1 (fig. 127) - with the noticeable exceptions of Al-Sufouh and Al-Abraq. One may assume that destruction, such as that at Hili M or RJ-1, happened when a large kin-based group decided to build a new, larger and more monumental grave for the community, with more funerary chambers and large facing ashlars instead of the old-fashioned sugar lump stone. It was indeed a costly decision for everyone. It could have been taken to demonstrate the wealth of the group in front of neighbouring ones or to house a group which, through alliances or other processes like claims to ancient prestigious affiliations, had changed in its composition and wanted to display these changes in order to enhance its status in the local competition for power. Many other factors may have been involved, but we may be sure that these changes in funerary rituals are an illustration of the expansion of Early Bronze Age Oman towards a wealthier and more complex society.

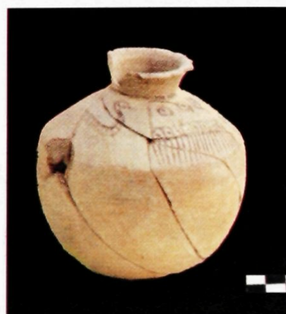


Figure 135:
A small bottle with a peacock and comb motif, an obvious import from the Indus valley. Tomb A at Hili North, ca. 2300-2100 BC (photo French Archaeological Mission to Abu Dhabi).



Figure 134 – A small jar of red ware with black paint representing a caprid in a vegetal landscape, Tomb A at Hili North (2300-2100 BC). It was very probably imported from Baluchistan (photo French Archaeological Mission to Abu Dhabi).

The objects found in the "Umm an-Nar" graves are also of interest. As before, these are remarkably similar and homogeneous throughout Oman. We have already noted that a few pottery items of foreign origin deposited as offerings in the "Hafit" type burials were possibly related to the importance given to foreign exchange by the local society. With the earliest "Umm an-Nar" type burials, the number of vases deposited increased, including both fine locally made painted ware and still some imported pieces. By 2500 BC, the amount of pottery deposited in the graves explodes, reaching ca. 1000 vases at Hili north A. Some 50 % of the pots are of the fine red-painted ware (fig. 131) that seems to have been produced at that time only for funerary purposes and is not found, or only in small quantities, in contemporary settlements, while some 40 % comprise the coarser sandy orange ware which was massively produced to meet daily household requirements (fig. 230, 231). The remaining 10 % consist of various classes of small painted ware imported from south-eastern Iran (fig. 132, 133), Baluchistan (fig. 134) and the Indus valley (fig. 135). We may accept that foreign vessels were deposited in the graves for their intrinsic value, but other pottery probably contained various foods or liquids (unless they were considered as a substitute for their possible contents). These global figures could, however, hide some more interesting facts. With one possible exception, all the 26 vases associated with the 31 skeletons in primary deposition in tomb A are imported wares (25 %) or fine funerary vessels (75 %), thus suggesting that the domestic pottery was used in different aspects of the rituals. Tomb A at Hili north also

yielded some 85 locally made vases of chlorite, a variety of green soapstone (fig. 235, 236). These were mainly hemispherical bowls or small rectangular boxes with a flat lid, decorated with a very distinctive pattern involving rows of two concentric circles. Although very few of these objects were found in the settlements, we may not conclude that these objects were mainly made for funerary purposes. They were probably deposited with some food preparations or fragrances (or as an empty substitute for these preparations), probably the kind of goods customarily packed in such containers. Unlike pottery, these bowls do not break easily and this is why we rarely find them in the settlements: as a matter of fact, though a few vessels discovered in the graves are new, and sometimes unfinished, most are worn, deposited there after years or decades of use.

Considered from a long-term perspective, the so-called longue durée of historians, funerary rituals throughout the Oman peninsula illustrate the evolution of the society itself. The dead are from the beginning intentionally mingled in a kin-based community, something that had probably started in the 5th millennium BC but is now a definite rule. Burials are no longer in settlements but in the landscape, well designed to mark territorial rights and access to natural resources or basic means of production created by the work of whole the community such as wells or oases. From the number of individuals found in the Hafit type cairns, it can be assumed that the criteria for placing a certain individual in a particular grave are to be sought in family affiliation. Some particular grouping of the cairns may also suggests that tombs belonging to larger family groups were clustered together, but this cannot be proved. With time, when the affirmation of territorial rights was no longer a primary necessity but a consolidated reality, a new dimension of society became privileged. The large Umm an-Nar graves with their complex rituals house a much larger community of ancestors, say at clan or tribal level. We will see later that oases settlements were mainly structured around large tower buildings, and one could suppose that each of these large tombs, so costly to build, with their expensive special offerings, may have housed the community of those who had been grouped around the towers during their lifetime. Once this lifetime was over, everybody entered through a complex processing of their physical remains into the world of the ancestors, regulated by the most important criterion of social organisation: kinship. This strong manifestation of "equality" inside the community should not be taken as witness of a strictly egalitarian society but rather as the ideological affirmation of what should have been beyond the complexities of diversity in wealth and power among the living. The contradictions raised by such situations should have been solved through these spectacular funerary rituals that were meant to endorse a higher community principle. The evolution of the tombs accompanies the consolidation of a social system based on territoriality and kinship bonds, but which nevertheless was able to cope with the development of new technologies and wider exchange with distant peoples. This different pathway can be called tribalism, as opposed to the hereditary ranked societies that emerged during the same time in other countries of the Near and Middle East. The society became organised around a flexible network of kin-based political and economic alliances among clans and larger lineage groups, much more efficient in a rugged and diversified environment than the hierarchical systems adapted to the agricultural plains of Syria and Palestine or to the large alluvial corridors of Egypt, Mesopotamia and the Indus. The story of the Early Bronze Age society of Oman recounts the affirmation and strengthening of this tribal structure from the end of the 4th millennium to the eve of the 2nd millennium BC and its achievements in building a civilisation able to resist the big centres of power of the time while actively participating for its own benefit in a widely developed international network of exchanges. ❑

Window 5

Tomb 1 at Ra's Al-Jinz RJ-1 and its Associated Bone Pits

By Herve Guy and Olivia Munoz

Tomb 1 at RJ-1 was excavated during three seasons by the Joint Hadd Project, between 2002 and 2004. Only the underground part of the monument remained, built in a round excavation, 30 to 40 cm deep, cut down to the bedrock through the sediment of the early 3rd millennium settlement. It was 8 metres in diameter and divided into two sectors by a partition wall running more or less east-west across the diameter. Each part was then divided into four chambers by three walls, making eight compartments in all. Over this preserved part, one can imagine a pavement of large flat slabs, of which only one remained. The elevation of the upper part is unknown but one may hypothesize that it consisted of only four chambers, as part of the dividing walls were only meant to support the pavement slabs. According to the material found, the use of the tomb may have lasted two-three centuries, around 2550-2350 BC. There is evidence that the tomb was then dismantled, levelled to the ground. The stones of the upper part and the large slabs covering the lower part were recovered, probably to build another tomb nearby, and the lower part was filled with clean yellow clay from the plain, that had to be transported half a kilometre to the top of the mesa where RJ-1 is located (fig. 136).

Some two metres south of the monument, directly below the surface, were discovered three elongated parallel pits full of dislocated human bones and dug through the previous sediment to the bedrock. It is unclear whether they were dug simultaneously or at different times, although the latter seems likely (fig. 137). More than 22,000 bone fragments were collected between the tomb (ca. 2500) and the pits,

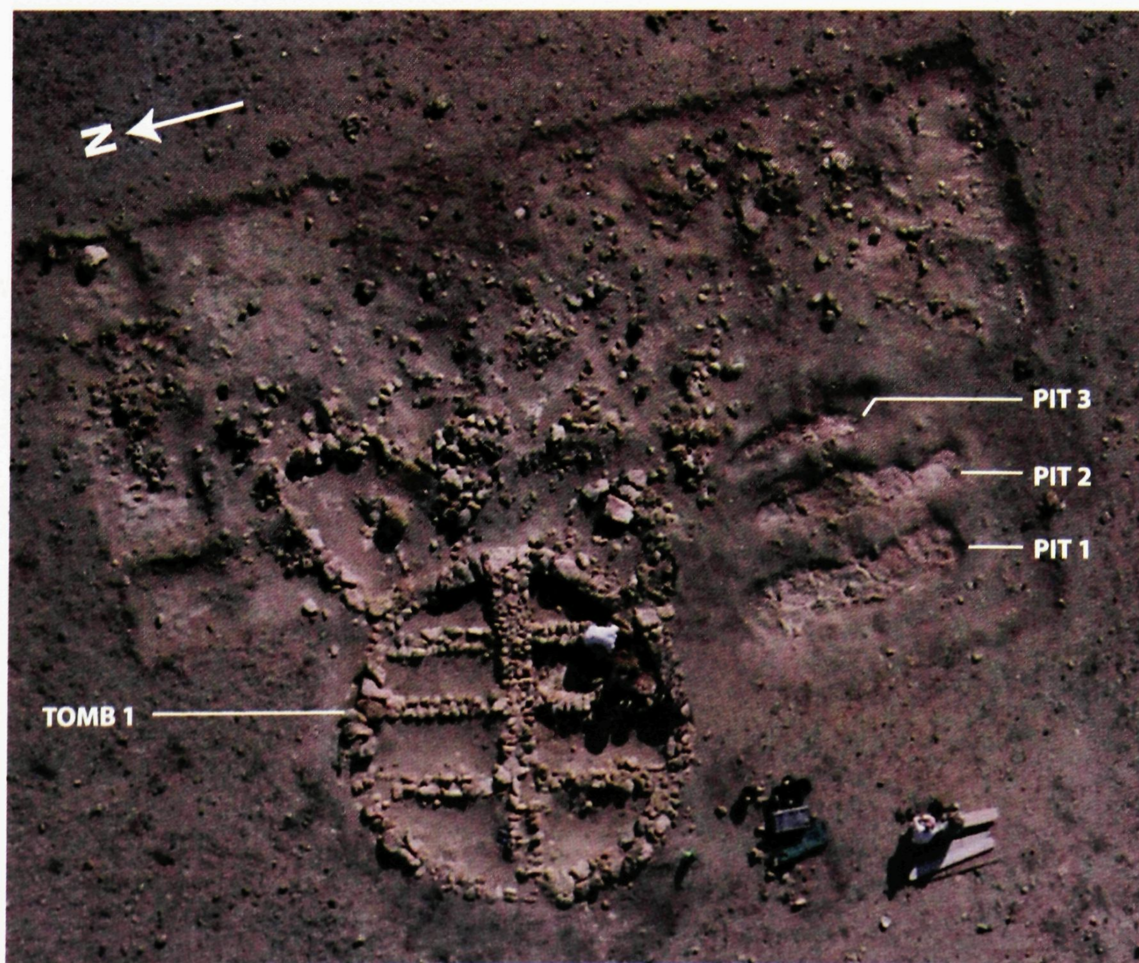


Figure 136: A kite view of tomb 1 at RJ-1 and three associated pits (photo Joint Hadd Project / Y. Guichard).

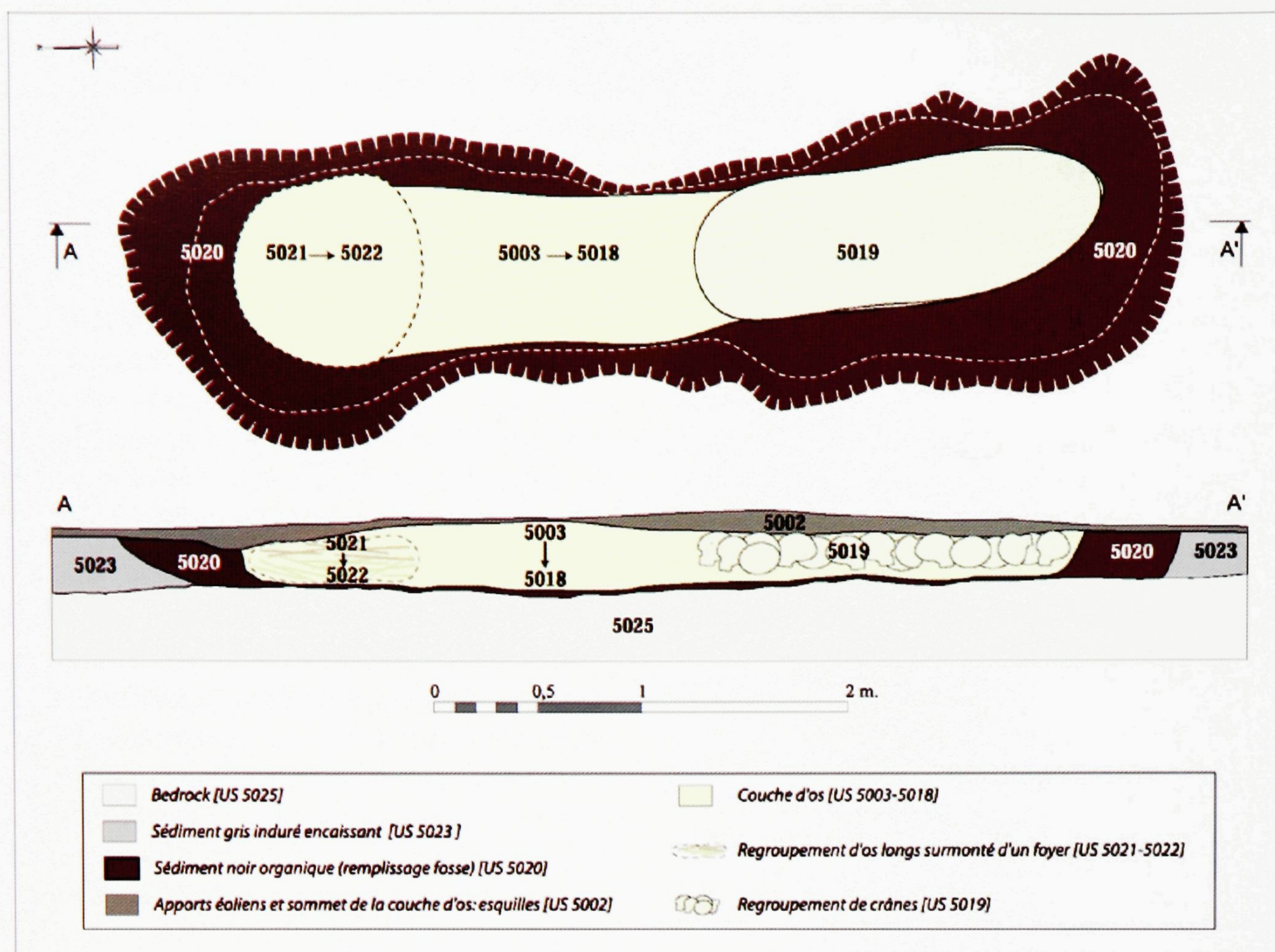


Figure 137 – Plan and longitudinal section of pit 1 (Joint Hadd Project / O. Munoz).

allowing a partial understanding of the buried population and the funerary practices.

With a few exceptions, the bones found inside the tomb were not connected with one another. This can probably be explained by the fact that no complete bodies were deposited in the subterranean part of the grave, and that the bones and bone fragments found there fell from the upper part at the time the monument was destroyed.

Inside the pits, the bones were always separated from the inner surface of the excavations by a black sediment rich in organic components, suggesting that they were deposited in a container, perhaps made of wooden planks, that had since long disappeared.

At first sight, the bones found in bone pit 1 appeared dislocated and disorganised, until a group of 28 skulls was uncovered when excavating the southern part (fig. 124). To the north, many long bones of lower and upper limbs, well preserved, were arranged as a polygon around a possible hearth (fig. 123). A grouping of long bones was also detected in pit 2. On various occasions, some bones were still anatomically connected, mainly fragments of hands, feet and rachis. In two cases foetal bones were discovered together. It is impossible to tell if these were still grouped together when the bones were moved from the grave to the pit or if the stillborn babies were directly deposited in the pit.

Half of the bones found in pit 1 were burnt. These were mainly located in the upper part of the filling while deeper only some areas appear to have been in contact with combustion heat. It ranges from traces of rapid stoking (40 %) to long burning at high temperature (60 %). Almost all were burnt when the flesh was gone, with a few exceptions, as for instance four vertebras which were still connected

and appear to have been burnt fresh. North of the pit, a hearth was probably set in the upper part of the filling and all the bones were deeply burnt. A few burnt bones here were also found in pits 2 and 3, usually burnt at low temperature, and almost none in the tomb itself (fig. 138).

This leads us to conclude that the corpses were first deposited in the upper part of the tomb. When the flesh was gone the bones were removed and deposited in pits. One may imagine that the pits were dug on the occasion of such activities, which occurred at least twice during the use of the grave until it was eventually emptied and destroyed. On this occasion, the operators did not hesitate to remove some corpses that were not completely fleshless, probably the last ones deposited in the tomb, as demonstrated by the persistence of some anatomical connections in the pit. The bones were not simply thrown into the pits but often reorganised

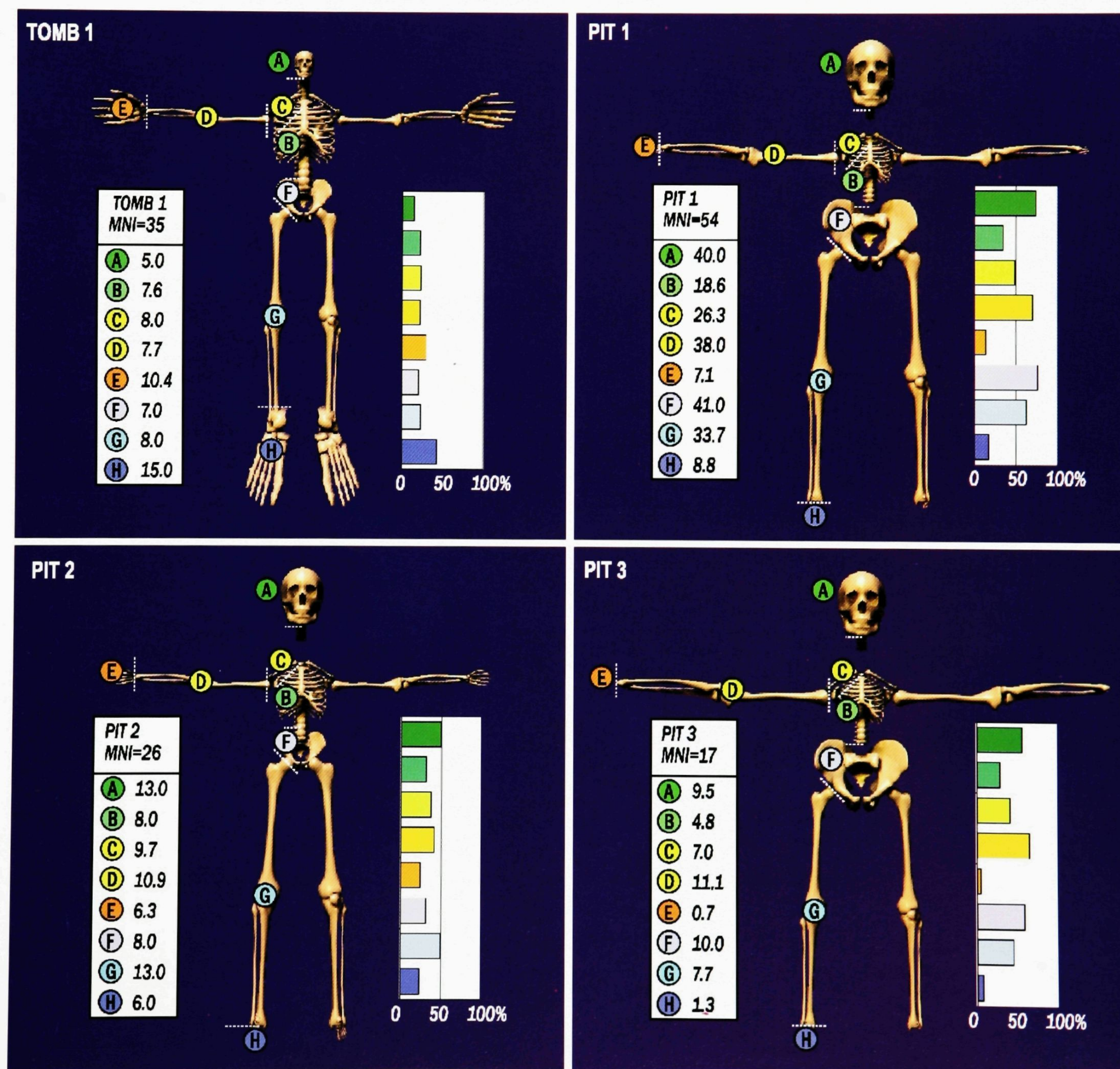


Figure 138 – Anamorphic representation of the bones found in grave 1 and the three pits. The size of each bone is determined by its frequency in the tomb or the pit. (Olivia Munoz, using software Poser 3.0™)

according to categories, a practice common in all collective burials across the world.

The bones found in such burials are also an important source of information about the population of that time. Although it was very difficult, due to the high fragmentation of the bones and the fact that they have been mixed, it can be established that at least 74 individuals were buried in tomb 1 and the pits, although the figure could be much higher, up to over 100 *(fig. 139)*. Tomb 1 contained the remains of at least 20 women, 16 men, and 15 children below 15 years of age, whose sex could not be determined. A comparison of the number of young children with the average rate of death in an archaic population indicates that children below 5 were much fewer than expected, thus indicating that at least some of them were buried elsewhere, as indicated by the discovery of five tombs of babies or young children in buildings I and II at RJ-2 that are contemporaneous with the grave.

The average size of adult individuals was around 1.6 m, men being taller than women. The pathologies that could be observed on the bones may partly be due to occasional food stress, and repetitive physical activity or working accidents, but do not attest to systematic violence.

These excavations clearly demonstrate the complexity of funerary rituals and practices in Umm an-Nar burials. They complement the observations already made at Al-Sufouh, Hili North A, Hili N or Al-Abraq. The dead bodies went through complicated processes that ended with mixing all of them in the community of ancestors. On the other hand, it also confirms that the monuments in which such process partly took place were dismantled after two or three centuries of use, when new ones, usually larger, were built, confirming the importance of these funerary rituals in social and kinship politics.❑

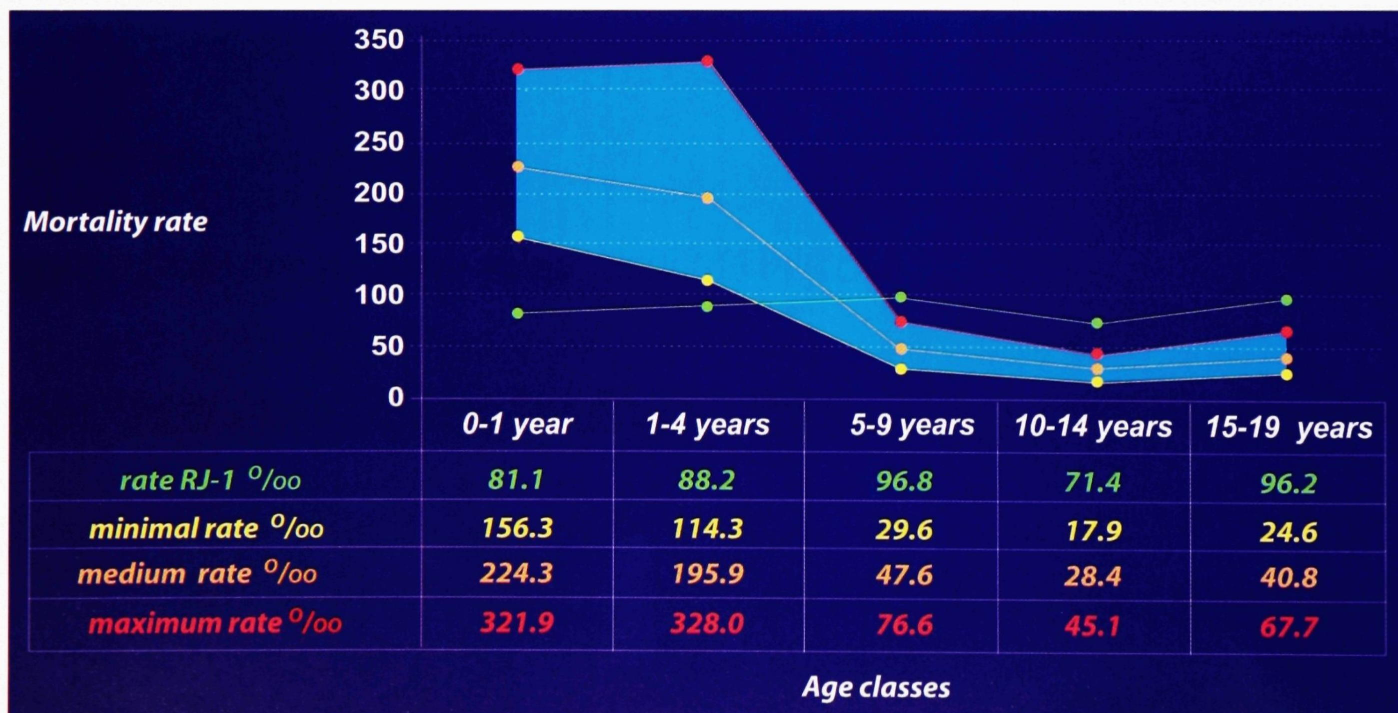


Figure 139 – The age of the dead found in tomb 1 compared with the average date of mortality in an archaic population. To the left of the diagram, the lack of young infants and of children below 5 years is obvious, leading to the conclusion that most of them were buried elsewhere.

Chapter 6

Taming the Desert: Oasis and Herds

Chapter 6
Taming the Desert: Oasis and Herds

Oasis are the hallmark of Omani agriculture (fig.140). Local climatic conditions here never allowed farming without irrigation, even in the moister period of the last humid episode of the Early and Middle Holocene between ca. 10,000 and 6000 years ago. At present, oases are found everywhere water can be brought to fertile soils by various kind of human devices: wells, surface or underground canals, pounds and pools made by different types of dams. The history of agriculture in Oman is the history of human ingenuity in building, maintaining and operating such devices to capture, transport, and store water from aquifers as well as developing the appropriate crops and farming techniques. The results of archaeological research allow us to trace the origins of Omani oases to the times of the great social and economic transformations that occurred here at the close of the fourth millennium BC.



Figure 140 - Irrigation in a traditional Omani oasis, Ibra 1978. Archaeology can now establish that this way of life is 5000 years old (photo Serge Cleuziou).

As already stated, water and fertile soils rarely occur in the same place in arid countries. Typically, permanent springs are found deep inside mountains, at the bottom of steep cliffs, or in narrow gorges where no cultivable land is available. Under natural conditions, water will flow for a short distance through waterfalls and natural pools until it disappears into wadi gravel and feeds underground aquifers. When soil can be moved, and distances are not too great, terraces are built on the slopes around natural springs; otherwise water is moved by digging small canals along slopes to feed pools (fig. 2) and other storage devices in the settlement areas. From there, under strict control of the people, water is distributed on the surface of natural sedimentary terraces where gardens can be established after removing tons of gravel and stones until a layer of fine soil suitable for cultivation can be created. Both types of agricultural engineering are known along the Omani mountains and they constitute the man-made part of their beauty and a tourist attraction of great value. Such oases can be seen in Wadi Bani Khaleed, Wadi Bani Kharus and elsewhere (fig. 7).

Further down the course of the wadis, the subsoil water table can be tapped by underground channels and again transported to flat areas on both sides of the main wadi bed, though only after huge labour investment. This can be seen, for instance, in the many oases that pinpoint the Wadi Sumayl gap. The largest oases are in the piedmont strip, fed by underground channels that tap supplies from the huge water table at the foot of the mountains and drive it through underground channels towards the largest agricultural areas in the rich wooded savannah environments. Buraimi, Ibri, Bahla, Nizwa, Ibra and

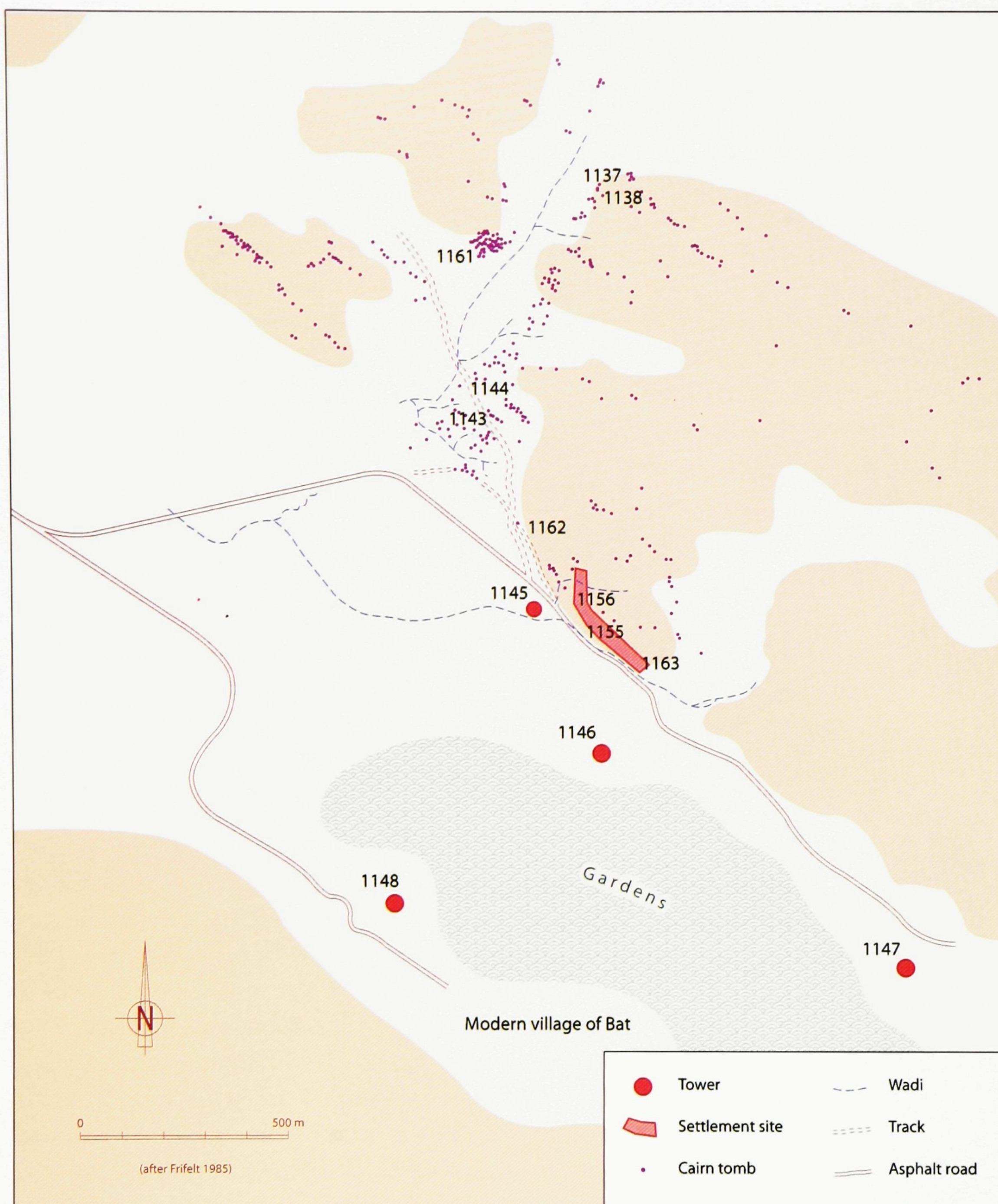


Figure 141: Schematic map of the Early Bronze Age settlement at Bat (Drawing by Hélène David, after Karen Frifelt).

many others represent this type of settlement. In the coastal areas, at the mouth of large wadis like Wadi Fulayj at Sur or Wadi Mijlas at Quriyat, oases are located near lagoons, combining the ecological resources of land and sea. Similar situations occur along the Batinah, where waters reaching the coast across the gravel plain are supplemented by wells fed from the underground aquifers all along the coastal strip. Not surprisingly, these various environments are also where the earliest traces of oasis agriculture in ancient Oman have been found.

Major agricultural settlements of the third millennium BC have been discovered and excavated, in more or less detail, at Bat (fig. 141), Bisyah, Amlah and Maysar; and many others have been recognised in places near Ibri, Yanqul, Bahla, Nizwa, Ibra and all along Wadi Andam in the interior. But the same is true for Wadi Far, near the point where it leaves the mountains to cross the gravel plain that separates them from the Batinah coast. None of the excavated settlements, however, can be dated as early as 3000 BC. The oldest remains are at Bat, where the earlier

layers presently known have been dated by radiocarbon to around 2800-2700 BC. However, the ancestors in their graves still play for archaeologists the same role they once played for the whole community. Their location on rocky ridges over most of the modern oases of Oman is a precious indication that these areas were already settled by 3000 BC or slightly earlier. Their presence around Bat, for instance, suggests that the earliest remains are still to be found on the site, and the same applies for Amlah, Bisyah, Al-Moyassar and many other places. The cairns excavated at Tawi Silaim near Al-Qabil and several thousand similar monuments at the foot of the mountains near Al-Kamil and Ja'alan Bani bu Hasan tell us that Wadi Al-Batha was already in ancient times the important farming area it is today, even if archaeological reconnaissance has failed so far to find any settlement remains. The same is true of Wadi Fulayj south of Sur, where scattered groups of cairns still overlook the small gardens cultivated near almost every permanent water pool and spring, while many others can be found near the palm groves of Bilad as-Sur. In a different environment, the small group of cairns at Halban near Sultan Qaboos University suggest that a small oasis existed nearby, comparable to the small settlement of Al-Jifnain - the first traditional oasis encountered when driving nowadays on the highway from the capital towards the interior. All these settlements would belong to the piedmont or downstream wadi types of oasis. But even in deep mountain valleys, for instance along Wadi Hilm south of Qalhat, small palm groves and cereal cultivation fields are still overlooked by groups of up to a dozen tombs, which may indicate that similar oases already existed here by the beginning of the

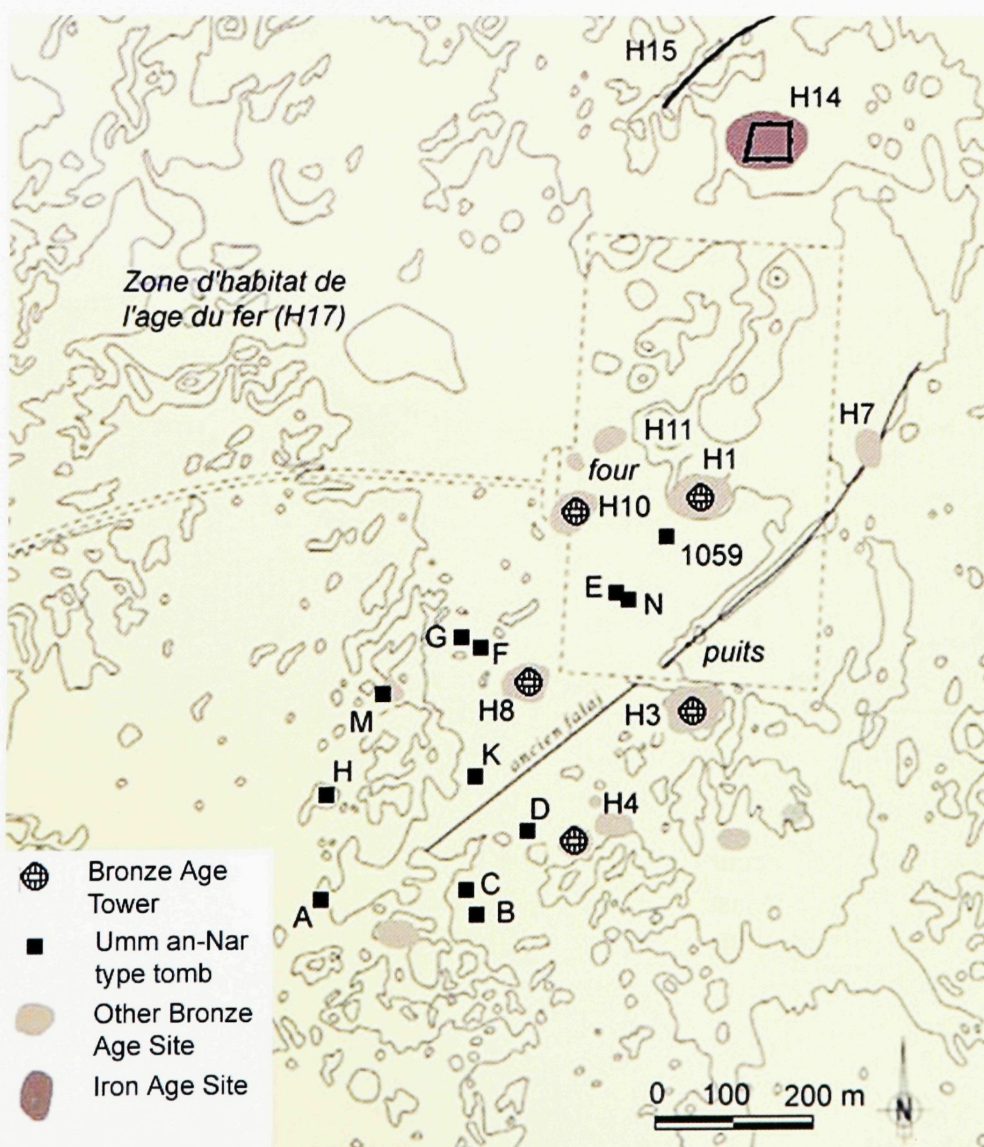


Figure 142:
Hili, schematic plan of the Bronze Age settlement (French Archaeological Mission to Abu Dhabi).

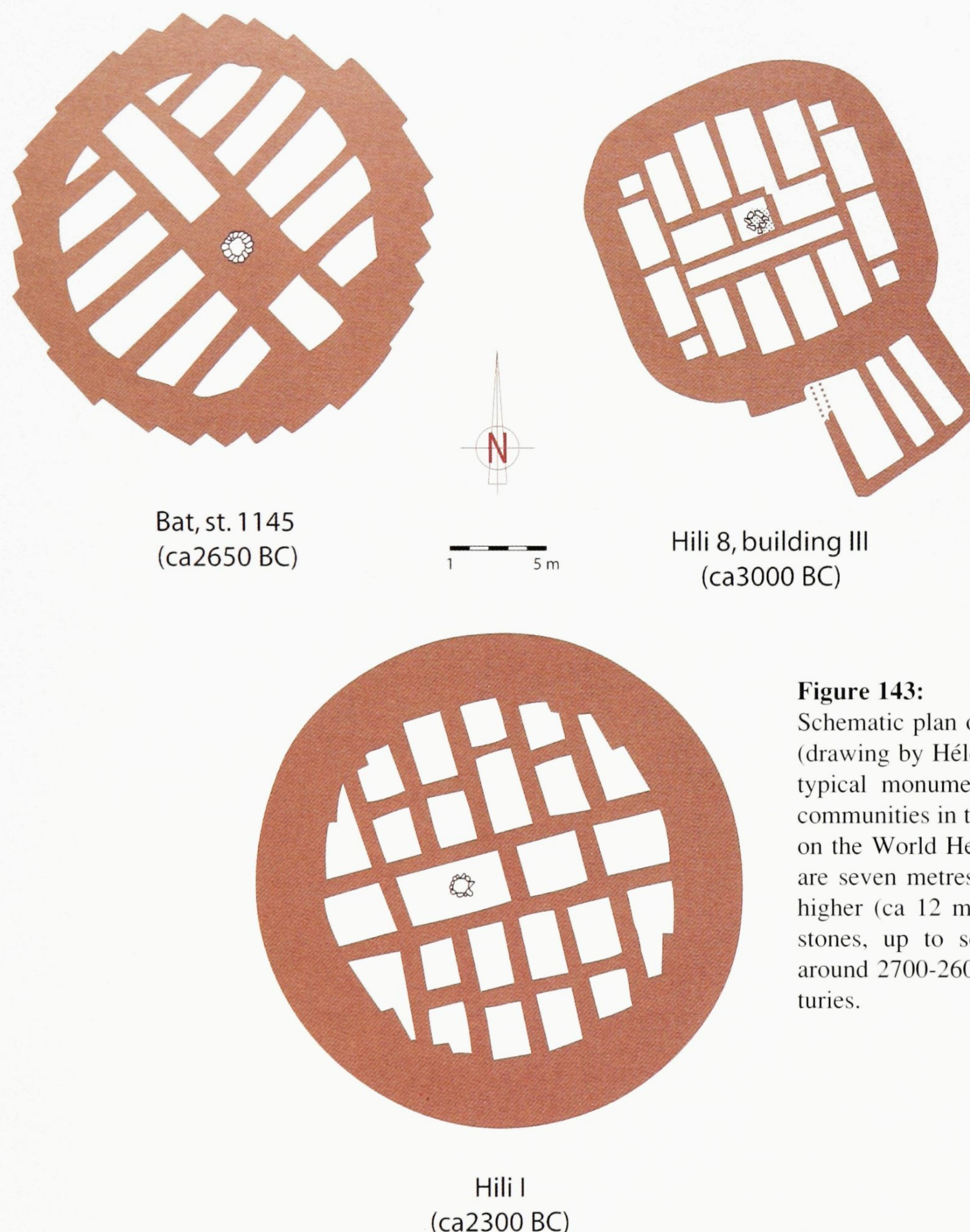


Figure 143:
Schematic plan of three Early Bronze Age towers (drawing by Hélène David). Tower 1145 at Bat, a typical monument of 3rd millennium BC oasis communities in the Land of Magan. It is registered on the World Heritage List. Its preserved remains are seven metres high, but it was probably much higher (ca 12 m or more). It was built of heavy stones, up to several tons each, at some time around 2700-2600 BC, and lasted for several centuries.

third millennium BC. This illustrates the importance of the agricultural revolution in Oman at that time: farmlands were developed wherever possible in all the areas exploited by foragers and hunters in the Middle Holocene.

We have previously seen that not all cairns in Oman date back to the early third millennium BC and that not all early third millennium BC cairns may be linked to settlements. Mapping and dating these cemeteries is an immense task and far from complete, but it provides a unique opportunity to draw with reasonable accuracy a map of early agricultural settlements in Oman. "Hafit type" graves not only identify the territories of Early Bronze Age political groups; they also help archaeologists to find their main settlements along the coasts near lagoons and fishing grounds where food could be extracted from the sea, or in the interior wherever food could be produced by creating the artificial environment.

This conjunction of oases and cairn burials does not necessarily mean that every oasis in Oman originated at that time, nor that all modern oases have a continuous history since 3000 BC. Vicissitudes of history and fluctuations in local environmental conditions, such as, for instance, sudden changes in the water table due to tectonic accidents or depletion after an unusually long drought, probably explain



Figure 144:
Tower 1145 at Bat, made of undressed stones: the most typical structure of the 3rd millennium BC oases communities in the Land of Magan. It is registered on the UNESCO World Heritage List. Its preserved remains are seven metres high, but it was probably much higher, up to 12 m or more. It was built of heavy stones, several tons each, at some time around 2700-2600 BC, and lasted for several centuries (photo Serge Cleuziou).

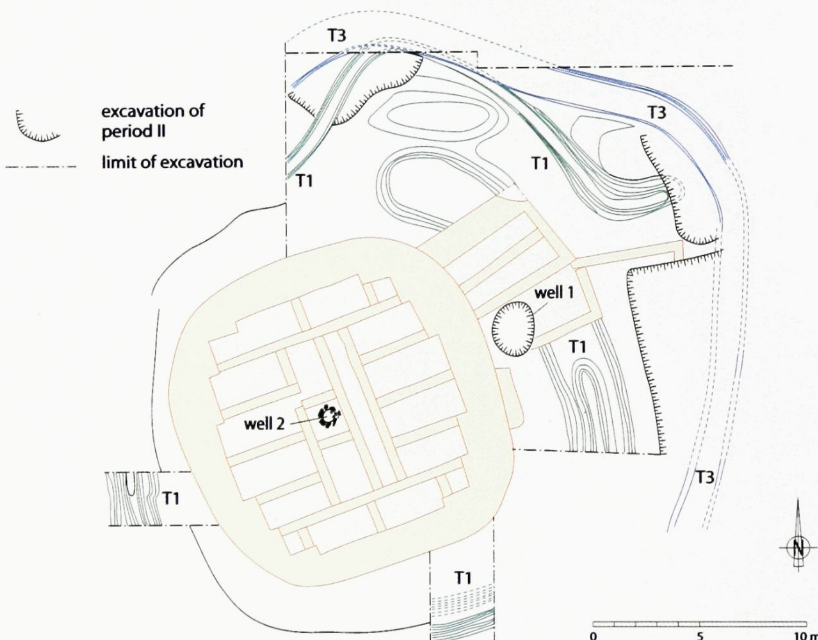
the temporary abandonment of some sites for varying lengths of time, while other similar events may have stimulated the creation of new settlements, due to the political determination of a group or a tribal leader. However, where we observe the conjunction of a modern oasis and the "Hafit type" graves, archaeological investigations are likely to uncover the remains of Early Bronze Age agricultural settlements. Among the many factors leading to this situation is the fact that agriculture is possible in only a few places. Difference in precise location may result from the various irrigation systems in use but, as we will see later, there is some evidence that by 3000 BC these systems were already rather similar to the modern ones. As a result, only minor changes in location have occurred since that time, linked to



Figure 145:
Bat, Tower 1145. Opening of the well at the centre of the round structure. It stands already seven metres over the base of the building and indicates that the monument may have been ten metres or more in total height (photo XXX).



Figure 146:
A general view of the settlement at Hili 8, displaying the earliest mud-brick tower surrounded by the remains of the second one and some adjacent buildings (photo French Archaeological Mission to Abu Dhabi).



Hili 8 : plan of period I.

Figure 147:
Plan of Hili 8 during period I (ca. 3100-2700 BC). The square tower with rounded corners is the first building on the site, dating from phase Ia (ca. 3100-3000 BC). It was surrounded by a ditch (T1) that is interpreted as a drainage channel and had a well in the centre (Well 2). A small building, possibly a store, was later added at the beginning of phase Ia (ca. 3000 BC), partly covering the abandoned drainage ditch that became used as a rubbish pit; and a new ditch was dug (T3), while all the area east of it was lowered by some 70 cm, probably to establish a palm tree garden. Well 1 was dug at a later stage (phase IIa, ca. 2700 BC) and belongs to a later mud-brick tower (drawing by Hélène David after a plan by Nicolas Chevallier).

minor but significant changes in the condition of the underground water tables. This has also some unfortunate implications. Under present conditions, being still the best places for agriculture, these areas are likely to have been widely exploited by man for several millennia and most of the traces of early agricultural settlements might thus have been deeply hidden or destroyed long ago or as a result of recent development. Except for a particular type of monument, for example the "towers" that will be described later, such traces are generally very inconspicuous and can easily escape the notice of even the most careful bulldozer driver.

Oases are a particular environment created and maintained by human communities in order to ensure, year after year, a reliable supply of food, not



Figure 148 – Hili 8 well 1. It was dug around 2700 BC, later dug again several times, and probably used until 1800 BC. The upper part, through the mud-brick walls, was carefully lined with stones, while the lower one was dug through the silty-clayish substratum. It was calculated that the many fallen stones found in the filling could have comprised the lining of the well up to some 10 metres, giving an idea of the height of the tower to which it once belonged (photo French Archaeological Mission to Abu Dhabi).



Figure 149 – Bat: an unexcavated Bronze Age tower (tower 1148) (photo Serge Cleuziou).

only by bringing a permanent supply of water but also by creating an artificial climate under the shade of palm trees (fig. 8, 140). Whoever has experienced it can never forget the special atmosphere associated with the shade of palm leaves, where the sun does not burn, where the wind does not blow, and where all sounds and human voices are clearly audible, mixed with the murmur of flowing water. Under this protection, fruits and legumes can be harvested several times throughout the year, while in the surrounding fields cereals and fodder plants like alfalfa can be grown during the milder months of the winter season (fig.158). Oases incorporate diverse farming systems and make possible the production of a variety of crops at different times of the year. Most with high nutrient value, like cereals and dates, can be stored and traded in various forms, being not only a source of food but also wealth (see window 6.3.). They are places to locate the activities of fairly large communities, including all types of arts and crafts like pottery, stone cutting, weaving or metal working, but at the same time they are also places that require vast labour investments, where conflicts will inevitably arise among diverging interests, and where the authority struggles daily to keep the social consensus necessary to maintain the flow of production. The fact that the largest cemeteries of "Hafit type" cairns are found in their vicinity also tells us that oases became the centripetal flywheel to enlarge the communities of Oman at the beginning of the Early Bronze Age.



Figure 150:
The main tower at Bisiyah, discovered in 1974 by Jim Humphries of the Harvard University Archaeological Survey in Oman. The site was first named BB-22, and later, when studied by the Birmingham Archaeological Expedition, led by Jocelyn and Jeffrey Orchard, was given the local name of Qarn Qarat Lawahid (photo Jürgen Christian Meyer).



Figure 151 – The tower of Al-Moyassar 1 (ca. 2300 BC). It was made of stones and mud-brick. The internal divisions and the well at the centre are clearly visible (hot air balloon photograph by the German Mining Museum, Bochum).

The plan of Bat during the third millennium BC clearly illustrates what such a centre would have looked like (fig. 141). In an area covering some of 40-50 hectares, and dominated to the north by a cemetery of several hundred cairns, are found the remains of five round "towers" built of huge stones (fig. 144, 149). These towers, twenty to thirty metres in diameter, stand at a distance of one hundred to several hundred metres from each other. Bisya has a similar setting, with six stone towers scattered over a large area on the right bank of Wadi Bahla and overlooked by a large cairn cemetery on Jabal Bu Rzuz on the other side of the wadi (fig. 150). At Hili, five mud-brick towers are known, scattered over an area of some sixty hectares while the cemetery is at some distance on the nearest rocky ridge available, Jabal Haqlah in Omani territory (fig. 142). On both sites as well as at Al-Moyassar, where only one tower made of mud-bricks with an outer wall made of stone is known, smaller rectangular houses of stones and mud-bricks are found that may represent part of the common dwellings.



Figure 152:
An unexcavated 3rd millennium BC tower at Firq, near Nizwa (photo Jürgen Christian Meyer).



Figure 153 - Date stones from Hili 8 period Ib, ca. 3000 BC (photo French Archaeological Mission to Abu Dhabi / Lorenzo Costantini).

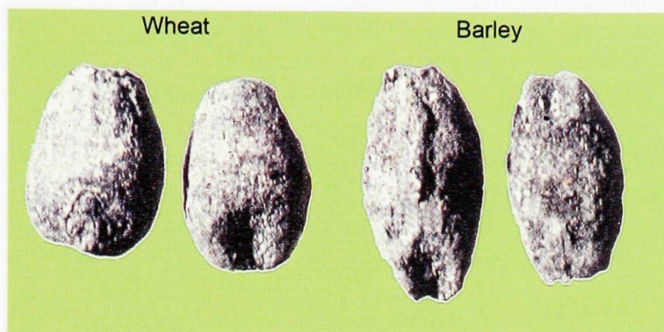


Figure 154 - Cereals cultivated at Hili 8 around 3000 BC: left: wheat; right: barley (photo French Archaeological Mission to Abu Dhabi / Lorenzo Costantini).

The "towers" are characteristic of the largest oasis settlements of the third millennium BC and are found all over the Oman peninsula, from Abraq, Kalba and Bidiya in the northern United Arab Emirates to Hili, Bisya, Bat, Al-Moyassar and many other sites (fig. 143). They were made of stones, of mud-bricks, or a combination of both. Tower 1145 at Bat is the best preserved of these monumental towers known at present (fig. 144). The stones used in the construction work are large blocks, often more than one metre in length, crudely shaped and assembled by a dry masonry technique without mortar. The construction followed a skilfully drawn plan, delimiting doorless rooms filled with smaller stones in order to obtain a solid drum at the base, a characteristic feature of all the towers so far excavated. Its remains are preserved up to seven metres above the surrounding plain, the remaining uppermost part still resting on the solid base drum, so that we can only suppose that at a higher level, ten metres or more above the ground, living quarters partly followed the plan of the main walls and broadly included two rows of rooms on both sides of a central rectangular space. This spectacular monument was surrounded by a five-metre wide, three-metre deep ditch. No real access device was found, so that we can suppose that it could only be entered by means of a ladder or wooden passages, and access could be easily denied to any unwelcome outsiders. Excavations at Bat and Al-Moyassar in Oman, or at Hili in the UAE, have also uncovered a well at the centre of the towers (fig. 145). The well probably opened into the central space of the living quarters, providing a permanent supply of water for those who lived inside. All these elements combine to suggest that the towers are fortified residences for prominent members of the community, whose affiliates, clients and kin-related groups were housed at the foot of or near the tower. In case of disturbances, they could be used as fortifications against groups of outsiders but also, and this cannot be ruled out, against other groups living in the same oasis.



Figure 155 – Imprint of a sorghum spikelet (Sorghum bicolour var. durra) cast in a mud-brick at Hili 8, ca. 2500 BC (photo French Archaeological Mission to Abu Dhabi / Lorenzo Costantini).

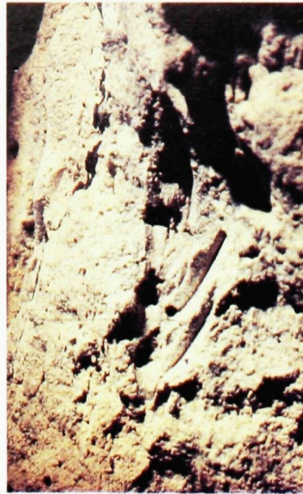


Figure 156:
Imprint of a barley spikelet cast in a mudbrick at Hili 8, ca. 2500 BC (photo French Archaeological Mission to Abu Dhabi / Lorenzo Costantini).

According to radiocarbon determinations, tower 1145 at Bat was built around 2600 BC. As a matter of fact, the earliest known "tower" at present is building III at Hili 8, dated by radiocarbon to around 3000 BC, the first of a sequence of three towers built on the same spot (fig. 146). But, as we may safely assume from the many cairn burials overlooking the site, Bat was settled around the same date, and we may also suppose that some of the towers still to be excavated already existed at that time. Such was also the case at Bisya, according to the excavators.

Man-made Gardens of Eden: Crops, Fruit-trees and other cultivated plants.



Figure 157 - Imprint of a jujube fruit stone (Zyziphus spina Christi) cast in a mud-brick at Hili 8, ca. 2500 BC. These small red fruits were consumed at that period as they still are at present in Oman (photo French Archaeological Mission to Abu Dhabi / Lorenzo Costantini).

Preliminary botanical studies at Bat show that palm trees and cereals (wheat and barley) were already cultivated on the site by 2750 BC. But the most complete information on early agriculture in Oman comes from levels associated with building III at Hili 8, the oldest mud-brick tower so far excavated. It is a massive square structure with rounded corners, some sixteen by sixteen metres, made of flat mud-bricks similar to those found in the most ancient excavated layers below stone tower 1147 at



Figure 158 – The main components of an oasis garden can be seen in this photograph, taken from tower 1148 at Bat. Fruit trees are among the palm trees, benefiting at least part of the day from their shade. Fodder and edible plants are cultivated in winter in the surrounding irrigated fields. (photo Serge Cleuziou)



Figure 159 –A permanent flow near Bilad Sait (Wadi Bani Awf) is partly diverted through a canal dug in the almost vertical slope at the end of a gorge. It will eventually reach the palm tree gardens, partly visible to the right (photo Serge Cleuziou)

Bat but also to those of the enclosure and houses at Ra's Al-Hadd HD-6, some 400 km eastwards. The preserved remains were only one metre high and all the "rooms" had been filled with sand and gravel to form a solid platform. At the centre was a stone-lined well. Dozens of charred grains and date stones were found (fig. 154), together with hundreds of animal bones, in the upper part of a surrounding ditch later used as dump, all dating from between 3000 BC and 2900 BC. This information is supplemented, as at Bat, by imprints of plants and grains in the clay of the mud-bricks (fig. 155-157). The date stones are without doubt those of cultivated palms and their occurrence in such a large number indicates that it was already the main cultivated crop and a basic food product for subsistence and exchange (a few pieces of charred palm wood were also found). From the same context originate charred grains of three different cereals, including three varieties of two-row and six-row barley (*Hordeum distichum, Hordeum vulgare, Hordeum vulgare var. nudum*), two varieties of wheat (*Triticum dicoccum, Triticum cf. aestivum*), and *sorghum* (*Sorghum bicolor ssp. bicolor durra*) (fig. 155). Legumes (peas) were also found, together with an unidentified variety of melon. These remains are all that we know about cultivated plants at Hili around 3000 BC, although they do not necessarily represent the complete list of all the plants grown there. From these, however, we can deduce precious information about both the agricultural system and its origins.

The agricultural system appears to be similar to that of the traditional oases of Oman in historical times. Various types of crops would grow under the shade of palm trees, among which only peas are known. Of course, most fruits now found in the oases of Oman, like citrus or mangoes, did not exist there at that time, but we may suppose that peas were not cultivated alone inside the gardens. Outside the protective shade of the palms, cereals, mainly

wheat and barley, were grown in adjacent irrigated fields during the winter season (fig. 160). This is an extremely important indication that early oases could already produce food at various times of the year: in August/September when dates were gathered, and in April when wheat and barley were harvested. Sorghum that could be grown in October or November further adds to this productivity. It is a summer-crop highly tolerant of heat and drought and could have been a precious supplementary substitute in years of bad harvest. Charred grains and imprints of jujube seeds (*Ziziphus spina christi*) were also found at Hili 8 (fig. 157), witnessing to the complementary exploitation of the surrounding wooded steppe, as jujube trees would preferentially grow in the best watered areas near the oases. Jujube is the only fruit remains consistently found in Middle Holocene sites. They might have kept dry for many months and eaten as snacks, like dates in later times. The earliest oases of Oman constituted an extremely efficient agricultural system.

The palm tree of course was the key element in the shaping of the new agricultural system. It provides both a rich food supply and the necessary artificial environment for growing other plants beneath its shelter. Dates, once harvested, can be processed using various techniques, from drying to the production of date honey. This allows one to preserve them for consumption throughout the year and for trade. We still do not know what techniques were in use during the third millennium BC, but the processing of date honey has been recognised at Bahrain as dating from the second millennium BC and may already have been practised long before (window 6.3.). Fresh or processed, the dates reached coastal sites to be exchanged for products of the sea, mainly fish (dried, salted or smoked) that added to the diet of oasis people a necessary though minor amount of proteins. That they were an essential item of daily food consumption is directly illustrated by the skeletons in tomb A at Hili north, where even young adults showed up to 90% of missing molars due to excessively high sugar consumption.

As far as the origins of the system are concerned, most plants found at Hili 8 do not belong to the ancestral vegetation of Oman and were consequently brought from outside. The palm tree itself may have been endemic in some well-watered areas, but the origin of its cultivation, that includes a sophisticated process of artificial pollination, is still a mat-



Fig. 160 - A channel on the edge of the canyon at Wadi Shab. It feeds the gardens by way of a gentle slope carrying water tapered from a permanent flow half a kilometre upstream (photo Serge Cleuziou)



Figure 161 – A probably 3rd millennium open flow channel, built using a gentle slope, still visible from the surface, at Al-Khashbah (photo Jürgen Christian Meyer)

close relations visible in technology (pottery and metal exploitation) with eastern Iran; but most of the varieties of plants, including date palms, point towards Baluchistan rather than to Mesopotamia. Others, notably sorghum, are clearly related to East Africa and the highlands of Yemen in southern Arabia. One may suppose that at least some of these crops had long been present in the Arabian peninsula, where they could have been used in a kind of "chance agriculture", probably already practised by the opportunistic mid-Holocene foragers in their broad spectrum subsistence strategies. Cereals like wheat, barley or even sorghum are well suited to this: they can be sown after rains and eventually harvested. Such cultivation may have provided a supplement to the diet of the late foragers; but the combination of these plants into a sophisticated and complex system with the creation of the oases was the necessary condition for ensuring a constant and reliable supply of food for larger communities partly involved in activities other than food production, like mining and related crafts. It represents an intensification of production, much beyond the basic requirements of subsistence, that facilitated the accumulation of stocks and the development of regular exchanges on a much larger scale than before.

ter of discussion. At present, the earliest cultivated palm trees have been found in south-eastern Iran, in the area of Dowlatabad, and in northern Baluchistan at Mehrgarh, where their cultivation dates from the fifth millennium BC. Date kernels originating from cultivated fruits have been recently dated from the middle of the fifth millennium BC on the island of Dalma in the Gulf, associated to imported Ubaid ceramics from Mesopotamia. Although there is little expectation that they could have been grown there, we may suppose that their cultivation and trade were already happening on some scale at the beginning of the Middle Holocene. Wheat and barley could have originated from any of the neighbouring regions where agriculture had long before been developed, such as Mesopotamia, Iran or Baluchistan. This agrees with known cultural and commercial relations such as the copper trade with Mesopotamia, or

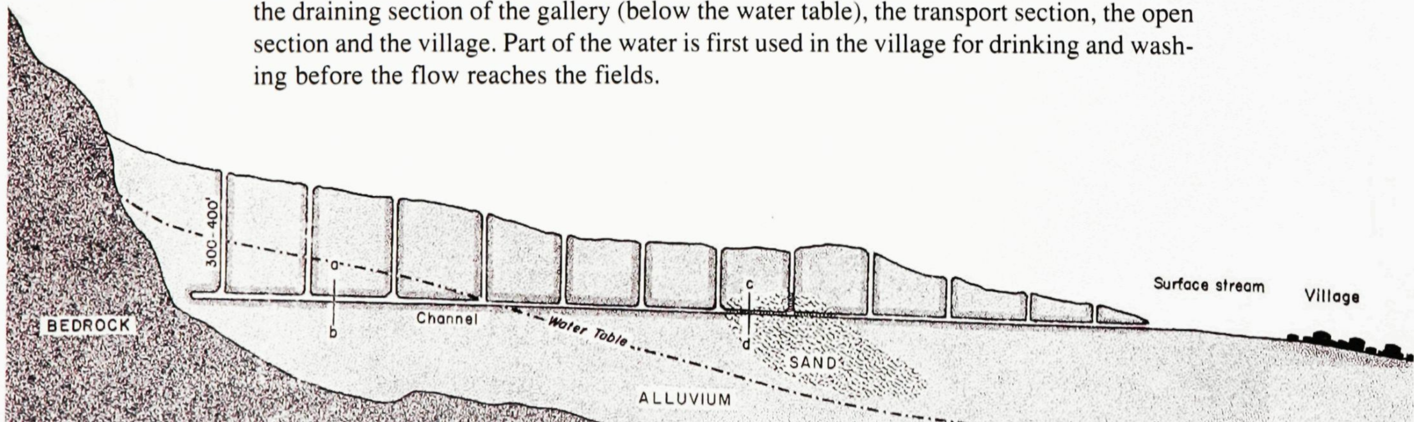
The Earliest *Falaj* System in Oman.

The other indispensable physical element for the establishment of oases is irrigation. Most archaeologists still wonder about the techniques used during the third millennium BC. The Falaj, the traditional method of Omani irrigation, is generally supposed to have been introduced at the beginning of the first millennium BC. Before modern water pumps, this complex and skilful system of underground or surface channels brought water across several kilometres of rugged countryside to large oases or small gardens all over the country. Once the heavy work has been done, requiring the commitment of highly experienced specialists rather than a large labour force, a *falaj* can permanently supply a sufficient amount of water to gardens and fields at very low cost, necessitating only seasonal maintenance. Palm trees require a permanent supply of water and, although feasible, to supply them with water from

wells would depend on harder and much less efficient work. Under various names, this system of water catchment and transport has been used in various places, from Central Asia (*karez*) to Iran (*qanat*) or westwards to the Sahara and beyond (*foghara*). It has been used even in Al-Andalus, Muslim Spain, and Palermo in Sicily where it was brought by the Arabs after the conquest, and even all the way to coastal Peru where it was introduced by Iberian Conquistadores, fully aware of its great value to grow crops in the most arid environments. There is general agreement among specialists that it came from Iran to Oman around 1000 BC, enabling the development of Iron Age settlements, possibly even under Persian political influence. Omani tradition itself attributes the construction of the *falaj* network to the pre-Islamic era. It also holds that Sulayman bin Dawood (King Solomon) commanded his servant geniuses to dig 10,000 falaj in 10 days in order to facilitate his daily trip between Persepolis (which he had founded) and Jerusalem, between both extremes of a heavenly kingdom of mythical perfections.

Various hypotheses have been proposed for the development of irrigation during the third millennium BC. It has been suggested that the towers with their wells could have been a hub at the centre of an irrigation network. This is highly unlikely because these wells were rather narrow (their diameter is ca. 60 cm) and more suitable for domestic consumption than for irrigation purposes. One might also question the need to take the trouble of raising water to a height of at least 7-10 metres when a lower height would have been enough to distribute it to surrounding fields. Obtaining enough water to supply the palm trees would have required the help of animal traction using cattle or donkeys, an arrangement found in traditional Oman, but the towers do not correspond to the type of structure suitable for such work. Other suggestions have included the use of *gabarbands*. These low walls of stones retain silt and a sufficient amount of underground water to keep the fertile soil moist till the next rainy season, still in use throughout Baluchistan and Makran. Possible *gabarbands* have been identified at Maysar and several other places. But even if such a device were appropriate for cereals, it would not provide enough water for palm tree gardens. Dams and pools may also have been used (mostly taking advantage of natural accidents in the mountains) that were long ago known to communities of foragers. There is little doubt that various solutions were already in use in the upper and middle valleys of the wadis to tap water from natural pools or from shallow aquifers in the gravel beds. But this would not do for the supply of water to large piedmont oases like Hili where the only possibilities would be simple wells needing much energy to pull up enough water to feed the palm trees. These considerations converge to suppose an early system of flow controls, out of which would develop the traditional *falaj*, well attested during the first millennium BC (see Chapter 9).

Figure 162 – Theoretical section of an underground falaj, showing, from left to right, the draining section of the gallery (below the water table), the transport section, the open section and the village. Part of the water is first used in the village for drinking and washing before the flow reaches the fields.



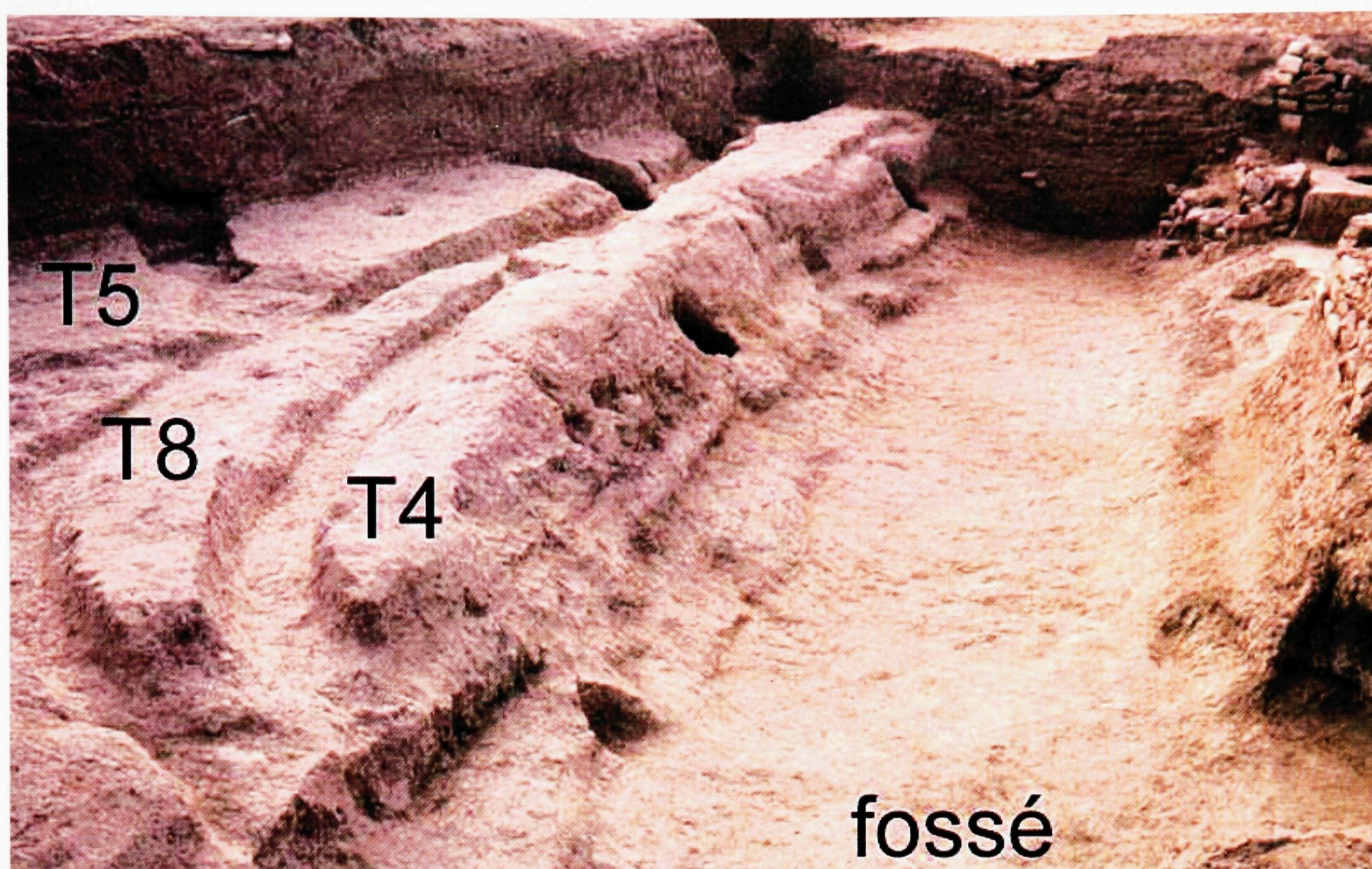


Figure 163:
The successive trenches channeling water to the surrounding ditch associated with the second tower at Hili 8, ca. 2750-2500 BC (photo French Archaeological Mission to Abu Dhabi / Lorenzo Costantini).

Explorations in the surroundings of the Bat towers have uncovered several layers of agricultural soil and some channels clearly linked to irrigation below the present surface; but these cannot be dated precisely although the probability is high that they can be related to the Early Bronze Age waterworks. Also at Hili occasional trenches dug in the plain for modern purposes intersected ancient channels of various shapes, depth and age; but the most accurate cross-dated information was again gathered at Hili 8. Around 2700 BC, the earliest square tower had been destroyed and rebuilt on the same spot with a circular plan 22 metres in diameter and surrounded by a ditch the size of the ones at Bat. The latter was 5 metres wide and 2.5 metres deep and the lowest part of its filling consisted of a greenish sediment, typical of humid conditions, indicating that it was filled by stagnant water for longer periods of time.

When the square tower was still in use all the area to the east had been dug in order to reach, 80 cm below the original surface, a 15 cm thick layer of ophiolithic gravel present everywhere across the plain. This process of lowering the gardens is very common in traditional oases. Humus is kept apart and redeposited in the excavated area to provide fertile agricultural soil for new cultivation. In the Hili oasis, this gravel layer was systematically looked for when establishing new gardens as it favours the circulation of irrigation water below the humus. The precise date of this earth moving may be placed after 2900 BC and before 2750 BC. It is the earliest evidence of an enormous labour investment to remove many tons of heavy soil, a clayish loam, probably to prepare the ground for a garden. At the same time, part of this soil could be employed to make mudbricks for towers and buildings around, although we have no evidence for the construction of a tower at the time it was dug.

At Hili 8 the ditch associated with the round tower was dug through this new surface. Uncovered

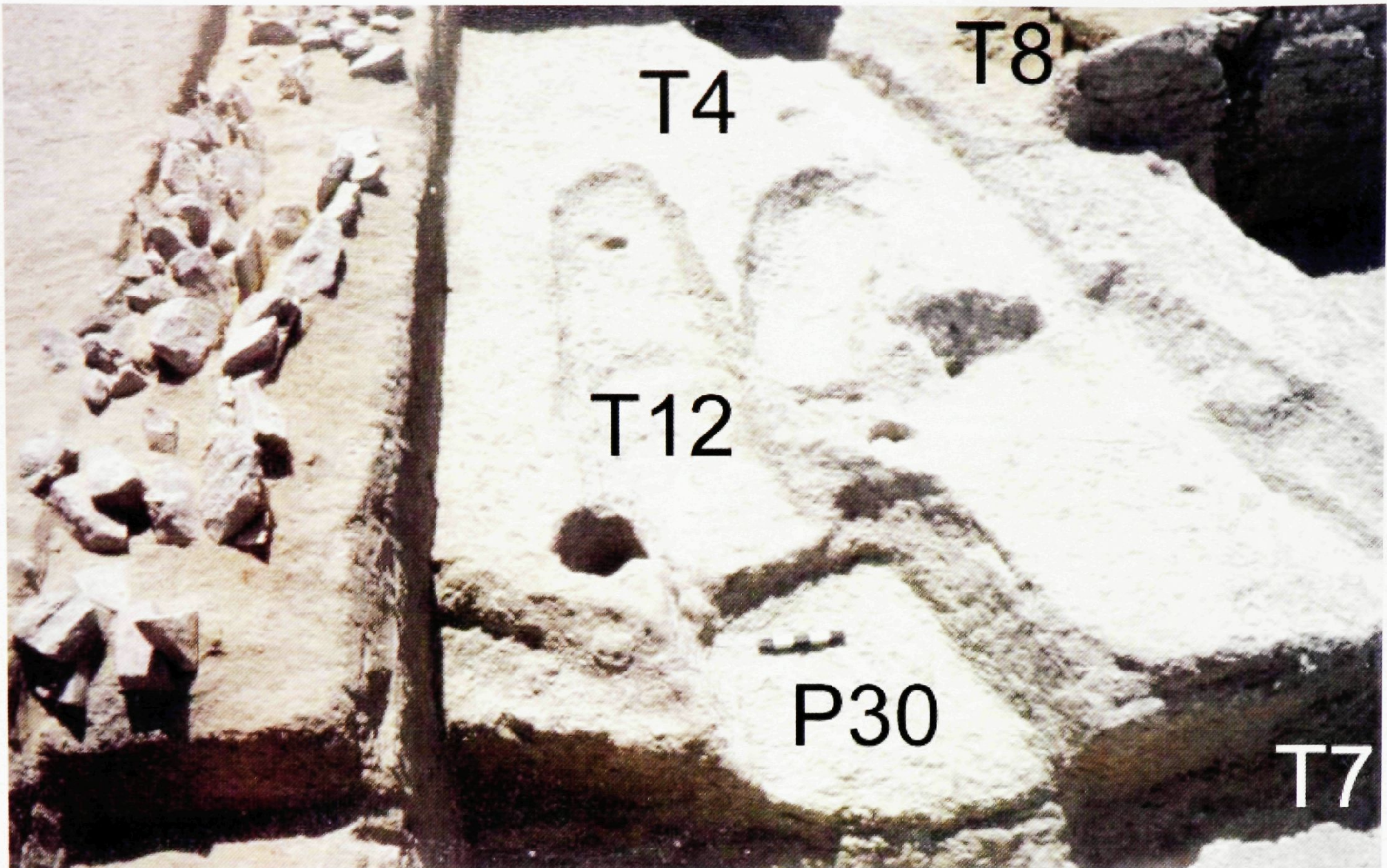


Figure 164 - Another view of the trenches channeling water to the ditch at Hili 8. The stone wall on the left is an early 2nd millennium construction dated to the Wadi Suq period (photo French Archaeological Mission to Abu Dhabi).

to the east are a series of four successive trenches that can be dated to between 2750 and 2550 BC (fig. 163-165). They opened into the ditch and can be understood as channels occasionally carrying to it extra water from the gardens. What is important for our purpose is that the earlier, rather shallow trench (15 cm maximum) is followed by a second one 20 to 25 cm deep, and then by a third, slightly deeper (25 to 35 cm). All crossed a small rectangular basin that may have been used for some household activity. Their depth also indicates that, at least in this section of the system, they were not irrigation channels, as these always had to run higher than the surface to be cultivated. The last and most recent one was 90 cm deep and stopped one metre before the ditch, being probably only used to carry water for the activities mentioned above.

The remarkable evidence is that four successive channels carried water to Hili 8 from a zone located to the south east, and that these trenches are each time deeper, indicating a lowering of the origin of the water supply system that can be estimated to 80 cm over a period of two or three centuries. This has two major implications: 1) that it was possible to obtain water in quantities exceeding the needs of agriculture and 2) that the level from where this water was obtained had to be lowered over time. This is exactly what would be expected if the trenches at Hili 8 were the end channels of a *falaj* irrigation system. The depth of the water table and the slope of the galleries (between 0.7 and 2 m per kilometre) are the key parameters of such a system, as they determine the place where water can be transported (fig. 162). In case of a drop in the water table, the gallery has to be deepened and the fields have to be moved downstream or dug down to the new level where water can flow, and this had probably happened in Oman already by 2750-2500 BC.

Excavations at Hili 8 have also enabled us to establish a four and half metres drop in the water table in that same area during the third millennium BC. This is indicated by the depth of the two wells

successively used. The first one, dug ca. 3000 BC and abandoned by 2750 BC, was found to be 4 metres deep, while the second, dug shortly after the abandonment of the first and used for a much longer period of time until the beginning of the second millennium BC, had been several times re-deepened and was 8.5 metres deep when last in use during the Wadi Suq period. Various geological studies along the piedmont of the Omani mountains corroborate the evidence of Hili 8 and indicate a general lowering of water tables during the third millennium BC, as a result of a delayed response to the dryer conditions that had developed a millennium before.

We have discussed this important question at some length, both because of its fundamental importance and in order to explain how archaeology is able to throw light on such controversial issues like the beginning of irrigation. The earthworks carried out by early third millennium BC people east of the first tower at Hili 8 are themselves an excellent sign of their capacity to undertake large-scale operations and of their knowledge of water levels in arid environments. The archaeology of channels, wells, fields and gardens has rarely been practised in the Middle East but has recently brought excellent results in western Europe. The present data at Bat and Hili are still to be complemented, but we know that the potential to develop such a programme is present on both sites and probably on many others. Such evidence would probably be necessary to persuade many scholars to go beyond the commonly accepted dogma of a later origin for the falaj system. However the present evidence is an excellent basis to ground "an archaeology of the oases" in Oman and other arid countries in the Old and New World. For the moment, we may conclude by suggesting that the *falaj* system appeared in Oman with the earliest known oases, located in an environment favourable to such a system. This does not necessarily imply that it was locally "invented". If one considers the probable south-east Iranian origin of many cultivated plants and craft technologies (pottery, metallurgy) used in Oman since the end of the fourth millennium BC, the possibility that it was also borrowed from there is high, even if its presence in that area is as yet unknown. Archaeological research in the critical regions of Sistan, Makran and Baluchistan, although extremely promising, are at present less developed than in Oman. Since we know that a fully developed agricultural economy was already present during the fifth millennium BC across the whole region in Middle Holocene times and we may assume that proper irrigation techniques had to be used as well.

The Development of Animal Husbandry.

As already seen, according to the evidence of Al-Buhais in the interior of the Sharjah Emirate (window 3) and of the sparse but constant signs of goat and even cattle among the bones found at the coastal sites, animal husbandry has been well established in Oman since the fifth millennium BC. In the earliest levels at Hili 8 domestic animals occur among more than 95% of the total number of bones. More than 50% come from cattle, followed by goats and sheep (window 6.1.). Dogs also shared the life of the community as shepherds and guardians. Gazelle were hunted on a small scale, but considering that large flocks of such animals grazed in the nearby steppe, the few bones that remain indicate that their role as meat for food was only casual. Bones of donkey (*Equus asinus africanus*) and camel (*Camelus dromedarius*) are present in small amounts, although it cannot be determined if these animals were from a domestic stock, due both to the small size of the sample and the poor state of preservation.

Quite evidently the analyses of animal bones from an archaeological site may tell different things on the way each species was used by its inhabitants. Animals are not only eaten: when kept alive they also produce food, such as milk, and a variety of other products like wool, dung, etc. They can be used to work in the fields or for transport and they can help in watching or hunting. What we found in archaeological sites are mainly the bones of those animals that had been eaten, and from these bones much can be retrieved after a detailed analysis. The presence of more bones of young males than females, for instance, indicates that the latter were kept for the production of milk. The dog, unless it was eaten, would leave few remains, although its presence can be detected, for instance, from the

traces of bites on other bones. Working animals, and especially those used for transport, like the camel and donkey, although occasionally eaten when they die, would normally leave few bones on the settlement site itself.

With the development of copper exploitation by 3000 BC, farming and the exchange networks, the demand for animal power products and animal power would have considerably increased, with a consequent growth the herds and flocks. Apart from food for the labour force, the exploitation of copper mines would have needed leather to make all kind of bags, straps, and the furnace bellows, and of course beasts of burden to carry heavy loads to the mines (wood for ore processing, supplies for the workers) and from the mines (minerals and metal at various degrees of processing). Although carrying such loads on people's backs is not impossible, it is very probable that beasts of burden would have been used.

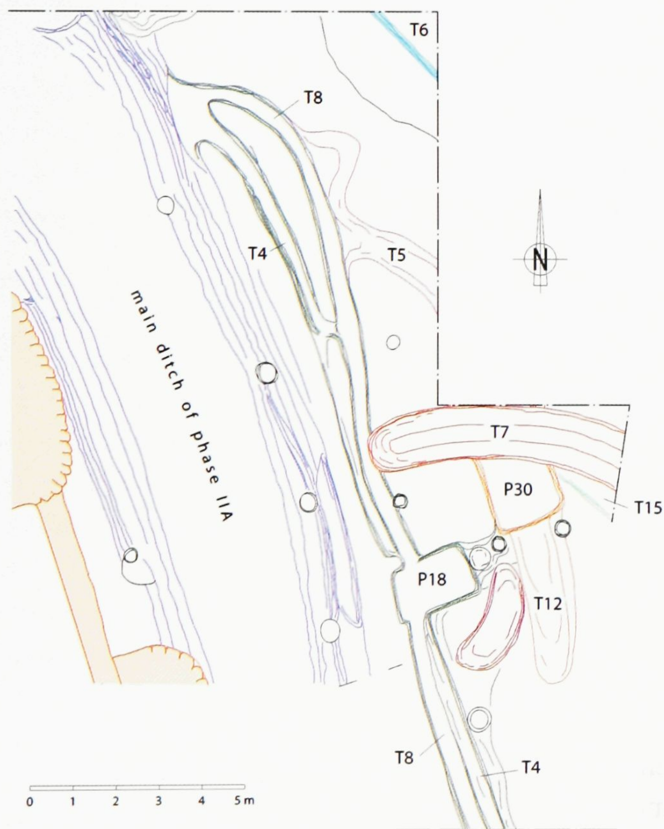


Figure 165:
Plan of the trenches channeling water to the ditch at Hili 8 (drawing by Hélène David after a plan by Philippe Gouin)

The two main candidates are the camel and the donkey. The domestication of the camel is of course a critical issue in the archaeology of Arabia, and a most disputed one. This animal is necessary for penetrating deep into the desert. Its presence in Oman is proved by a few bones at several sites together with a carving of it on a tomb slab from around 2500 BC at Umm an-Nar; but nothing enables specialists in archaeozoology to decide if it was hunted, and therefore wild, or already domestic. Considering this and the historical evidence, most specialists tend to suggest that its domestication did not occur before the very end of the second millennium BC. The most likely beasts of burden would in this case have been donkeys, whose domestication may have occurred, possibly locally, at some time around 3000 BC if not earlier (see chapter 4). This agrees with the late third millennium texts of Mesopotamia that describe the nomad caravans from the Arabian steppe trading from the Gulf (Dilmun) as composed of donkeys. In Oman itself an individual is represented as mounted on a donkey on grave 1059 at Hili, dating from around 2350 BC. While awaiting more zoological data, it can be suggested that by the beginning of the third millennium BC the donkey was the beast of burden in the first caravans of Arabia.

What is known already suggests that within a few centuries around 3000 BC most of the economic elements on which the country would continuously rely for millennia were already present. Agriculture and animal husbandry were fully developed and copper metallurgy was used, as evidenced by a few copper knives (Ra's Al-Hamra, Hili 8), pins (Hili 8, coastal sites and cairn burials), and fish hooks on coastal sites (Ra's Al-Hadd HD-6, as-Suwayh SWY-3 and Ra's Al-Jinz RJ-1). Pottery was known, both as Mesopotamian and Iranian imports and as locally made ware at Hili 8, but was little used outside burials. Basketry, found as imprints in the clay at Hili 8, or as fossilised carbonated material at Ra's Al-Hadd HD-6 (fig. 81), was certainly much more common. Small beads of stone and artificial material were made by the thousands already by the very beginning of the third millennium BC (fig. 83) as enhanced by the true carpet of manufacturing debris found on the floor of all houses at Ra's Al-Hadd

HD-6. They are used mainly as personal ornament for the living to signal status, rank and affiliation, although archaeologists have usually found them in graves.

The society that tamed the desert with domestic animals and managed to keep control of the exploitation of the coveted copper mines has already been described as an original one, structured by kinship, clans and tribal alliance rather than hierarchical order of ranks and functions. Most specialists will, however, tend to consider that the construction and operation of a falaj system would have required a kind of centralised political authority. In his classical book Man and Water in Southeastern Arabia, published in 1977, John Wilkinson advances what he considers "a discomformity" between the use of this technique and the Omani society. According to him, the form of land ownership in Oman "represents almost the opposite extreme to the type of land organisation one would expect from a society that had constructed the aflaj". The traditional political administration in Oman was opposed to centralisation and the concentration of power in the hands of a few and therefore was not suited to such an irrigation system. The vocabulary related to the use of water and the distributory system would in fact predate the introduction of the *falaj*, for which he accepts the traditional date of ca. 1000 BC, under "Persian rule". In Oman, the term *falaj* itself applies to "any source of running water" and not to the technique of acquiring water through a man-made system. The main preoccupation "is with fair distribution of this God-given resource" and its connotation is that of "a distributory system for sharing out water to those who have established an interest in it". This strengthens, according to Wilkinson, the hypothesis of an introduction from Iran, from another political and economic system. Tracing, as we suggest, the use of a *falaj*, or a *falaj*-like irrigation technique, back to the origins of agriculture in Oman implies that there was probably no oasis system, and no social organisation linked to it, prior to the introduction of the *falaj*, as both appear to be contemporary. Agriculture was developed in Oman by the end of the fourth millennium BC to meet the needs of a expanding society where lifestyle options such as agriculture and animal husbandry were already present to complement hunting, gathering and fishing in the late affluent foragers' communities built around wider and wider alliances. Such an economy would obviously have favoured resource sharing among equals or those reputed to be equals, even when adopting techniques and management systems coming from outside.



Figure 166:
The impression of the right foot left by one of the builders of the storage device at Hili 8, ca. 3000 BC (photo French Archaeological Mission to Abu Dhabi).

Oasis agriculture and the *falaj* were adopted by a society that imposed on them economic and political ideas linked to its own long past of sharing the results of hunting and gathering among the whole community. The discomformity underlined by John Wilkinson is therefore nothing else than the result of a general attitude of the populations of the Arabian peninsula towards the use of natural resources that is embedded in this long prelude. The desert could be tamed by those who had long experience of living with it and had treasured millennia of observations and knowledge about it. ❑

Window 6.1
Animal Economy in an Early 0asis Settlement
By Margarethe and Hans-Peter Uerpmann

A little more than 2000 bone fragments with a total weight of some 12 kg were found during French excavations at the site of Hili 8 near Buraimi (fig. 167). This was not much in comparison with the amount of soil moved during the excavation – and almost nothing in relation to the length of time during which they had accumulated. Most of the fragments came from contexts of Period I, which lasted about 300 years between 3000 BC and 2700 BC. Thus, on average, less than 10 pieces of bone were preserved each year. Considering the fact that every slaughtered animal yields about 200 complete bones – which are smashed up during preparation to become 500 fragments or more – it is obvious that what remained was only a minute sample.



Figure 167 – Animals of Hili 8: Cattle, goats and donkeys were already domesticated by 3000 BC. Camels are represented by some bones and were probably eaten, but were still wild. The Oryx was not found among the bones but is represented on tomb 1051 around 2300 BC and was obviously an animal of important symbolic value

The first conclusion from this small number of bone remains might be that animals played a minor role in the economy of Hili 8. As meat or milk are the most important sources of protein for human consumption in an inland environment of eastern Arabia, this is very unlikely. It is known, on the other hand, that bone does not preserve well at sites in this region. Empirically we assume that the 2000 fragments represent less than 1% of the bones which had been there originally. However, the processes which caused a particular piece of bone to disappear were probably not selective with regard to the animal economy of Hili 8. Therefore, our small sample can still yield valuable information about human behaviour at the beginning of the 3rd millennium BC.

Most of the meat eaten at Hili 8 was produced by animal husbandry. Hunting played a minor role with only about 1% of the meat coming from gazelles. There are 4 camel bones – which also represent hunted animals – but because of the huge size of these animals they represent about as much meat as the 33 gazelle bones. A single hare bone has no significance with regard to the amount of meat obtained by its hunter.

Among the domesticates, cattle were the most important producers of meat and – possibly – milk. During phase Ib almost 60% of the meat eaten at Hili 8 was beef. The few bones from phases Ia, Ic and period II indicate that the importance of cattle increased during the first 300 years of the settlement and remained high in period II. Sheep and goats were more numerous than cattle, but – with the exception of phase Ia – produced less meat because of their smaller size. Throughout period I, sheep slightly predominated over goats as meat producers, but this was probably outweighed by the better milk production of goats. In period II goats seem to have become more important than sheep. As goats are browsers, preferring leaves of herbs and bushes, whereas sheep are mainly grazers, the shift towards period II may indicate a changing environment – either because of over-exploitation or climatic reasons.

Although the Buraimi area is comparatively lush today, it is surprising to find an animal economy there based primarily on cattle husbandry at the beginning of the 3rd millennium BC. This contradicts the results from Umm An-Nar Island and Tell Abraq, where wild resources played a major role during the Early Bronze Age. As a number of cattle bones from Hili 8 show pathologies which indicate that the respective animals had to work, the use of oxen for traction is most likely. Some bones of asses occur already in phases Ib and Ic, but there is an increase in period II. As also indicated by a depiction on one of the Umm An-Nar graves of Hili, the donkey was available for riding and as a beast of burden, at least during period II. ❑

Window 6.2
Earliest Potteries in Oman
By Sophie Méry

Pottery production appears very late in Oman compared with other regions of the Near East. There is no evidence for it until the beginning of the Early Bronze Age, i.e. at the very end of the 4th millennium BC. The period corresponds to an important change in local technical systems with a probable transfer of certain techniques in pyrotechnology from the Indo-Iranian region. Quantitatively, pottery production in the Bronze Age remained small in the region during the 3rd millennium BC compared to the "mass" production found in Mesopotamia and the Indus Valley, south-eastern Iran, and Baluchistan. Thus, pottery retained a real trade value, to the point where foreign production was always associated with local funerary assemblages, often in important amounts.

Painted pottery vessels of Mesopotamian origin occurred at coastal sites from the end of the sixth millennium BC, belonging to a style known as Ubaid in Mesopotamia. However, they were not responsible for the emergence of autochthonous pottery production. Conditions were not propitious for local pottery production until the last centuries of the 4th millennium, when a new model for exploiting regional resources was to develop: agricultural oases. The earliest pottery of Omani fabrication was discovered on the site of Hili and dates from the beginning of the 3rd millennium BC (fig. 168). It was inspired by models from the Indo-Iranian region, in particular those of Keij-Makran in Pakistan. Not only is the decoration of the vessels inspired by contemporary decorative themes from this region, but the quality of the paste, its fineness and colour are also elements which are similar, together with their shaping technology. Every characteristic of these vessels thus differentiates them clearly from Mesopotamian pottery, even though the latter circulated in Oman, including the interior, during this period. The use of rotation in the fabrication of the earliest native pottery is certainly evident in Oman, but we do not know whether fabrication by

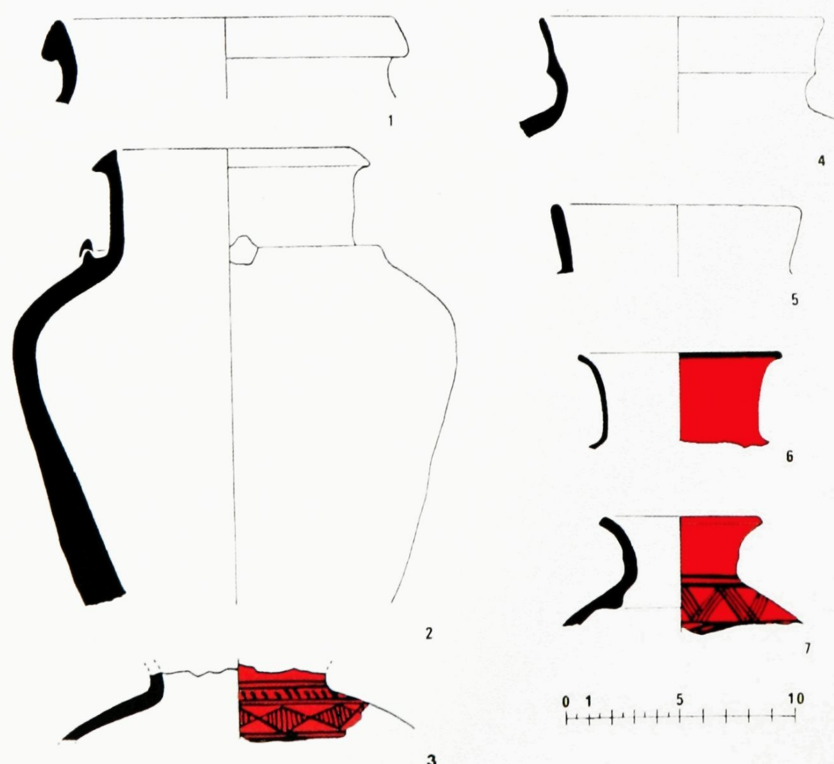


Figure 168 – Hili 8: Mesopotamian imported pottery (1,2,4,5) and locally made fine painted ware in south-eastern Iranian style during periods Ib and Ic, ca. 3000 – 2700 BC (Drawings by Philippe Gouin and Hélène David).

wheel in the strict sense (that is, making a pot from a unique ball of clay which is centred, hollowed, and drawn up by rotary kinetic energy) was mastered by the beginning of the 3rd millennium. The use of this technique, however, is beyond doubt a thousand years later, demonstrated by a current study of the material from tomb N at Hili, dated to 2200-2000 BC. However, this technique appears to have been little employed in the local and regional assemblages and concerns only small or medium-sized vessels; the majority were in fact made from coils finished on the wheel, from coils shaped on the wheel, or from coils thrown on the wheel. The four techniques are manifest at Hili among the local ware (fig. 169).

The Early Bronze Age appears to have been a turning point in the Middle East, when the use and variety of techniques using rotation increased. The study of the material from tomb N shows that quite different traditions of fabrication coexisted at Hili at the very end of the Early Bronze Age, including the fabrication of morphologically simple types, such as beakers. This proliferation of technical options illustrates particularly well the fact that the third millennium BC was a major period of innovation in the Middle East, the integration of rotation techniques being a process which was complex, non-linear, and possibly oscillatory. Analysis of Bronze Age pottery in the Oman Peninsula has explained a development in specialized craft traditions which were in interaction with the Indo-Iranian region. These traditions brought into play a large variety of fabrication techniques using the 'wheel' in different degrees up to wheel-thrown production of pottery. Even if they are not comparable to those used in the Indus Valley in the same period, the technical skills involved were generally considerable, and it is highly probable that training in pottery fabrication took place within family traditions of specialized workshops.

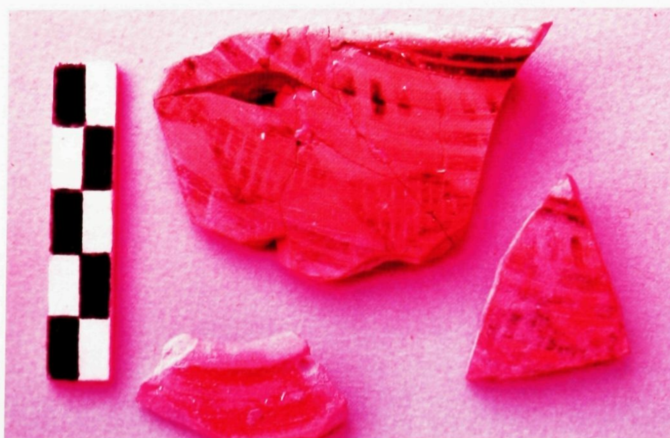


Figure 169 – Fine red painted ware of period Ic at Hili 8 (photo French Archaeological Mission to Abu Dhabi).

In our present state of knowledge, we can assume that pottery production in the Oman Peninsula took shape around two distinct categories of potters. One comprised those producing domestic pottery in the western foothills of the Omani mountains, generally confined to an oasis or a group of neighbouring oases. The other consisted of those potters who made funerary vessels; their products circulated over the whole of the Oman Peninsula, and even beyond, archaeometric analysis having indicated their presence in the tombs on the island of Bahrain at the end of the 3rd millennium. In the case of Hili, the only pottery assemblage in the western foothills which has been studied thoroughly enough, several family workshops functioned at the same time at the end of the 3rd millennium. These workshops produced vessels which only a detailed technological and morphological study could differentiate; the analysis of the ceramic paste indicates a strong homogeneity, showing that clay sources and preparation methods were essentially shared (fig. 168).

Fig. 1. The first local potteries in the Oman Peninsula were inspired by Dasht plain models.

The sherd photographed dates from the first occupation of the settlement of Hili 8, ca 3000 BC.

Fig. 2. Globular medium-sized jars were the best representative domestic types during the Umman-Nar period in the Oman Peninsula. The jar illustrated here was reused in a collective Umman-Nar grave (Hili North Tomb A, ca 2300-2200 BC).

Fig. 3. Experimental work at Hili revealed the large variety of fabrication techniques using the 'wheel' in different degrees up to thrown production of local pottery in the Oman Peninsula. ❑

Window 6.3
An Early Third Millennium BC Madbassa?
By Serge Cleuziou

Archaeologists are bound to make mistakes while excavating and to misinterpret their data. The time has come to confess an error almost 30 years old.

Any tourist visiting at least one of the many forts of Oman has noticed a typical structure called a madbassa, a store where dates are piled up in bags over a series of low parallel channels. Due to the dates' accumulated weight, they exude juicy syrup that flows down the gentle slope of the channels that merge into an outlet, and from there into a container, which may be a pot or a simple hole in the ground.

Various similar ancient installations have been discovered during the last thirty years. For some time, the earliest known madbassa was located in the late Hellenistic fortress of Qala'at Al Bahrain, before a possibly early second millennium BC one was identified at Failaka in Kuwait, and eventually a late third millennium BC one in the ruins of city IIa at Qala'at Al-Bahrain.

The structure that may be interpreted as the remains of a madbassa at Hili 8 is a small mud-brick building (building V, see fig. 147) built against the earliest tower, around 3000 BC. The main walls were made of a single course of mud-bricks delimiting three rectangular compartments, 4.5 m long and 1m wide. The base of the compartments, on ca. 0.8 m, was filled with mud-bricks and mortar and above it the walls were free-standing, still covered with a mud plaster; and because it was obvious that from there the compartments were left empty, we interpreted it as a storage device. Another particularity of the building was that the floor of these compartments was made with round bowls of clay still bearing finger marks (fig. 170) and in one case the imprint of the foot of one of the builders (fig. 166).



Figure 170 – Hili 8: a gently sloping gutter plastered with clay leaves building V and ends in a plastered circular pit. From this it is suggested that the building can be interpreted as a date storage device similar to the traditional *madbassa* of Oman and Arabia, therefore taking back the existence of such systems to the early 3rd millennium BC (photo French Archaeological Mission to Abu Dhabi).



Figure 171 – Hili 8: below the mud-bricks of later building IV (ca 2700 BC), in the foreground, appear the large clay bowls that constituted the floor of the storage compartment of the earliest known madbassa in Oman (photo French Archaeological Mission to Abu Dhabi).

There being no plaster over them, we have to conclude that the floor of the compartment was an irregular surface.

When this building was excavated, the role of date cultivation in the economy of the site was still unclear and we therefore suspected it to be a storage for grain. Moreover, we were not aware of the existence of a madbassa....

Thus, a small structure to the south of the building (fig. 170) appeared extremely strange and difficult to interpret. It comprised a small gutter carefully moulded in clay, leaving perpendicular to the building on ca. 40 cm, then turning 90°, and eventually ending in a small circular pit, ca. 40 cm in diameter - itself plastered with clay, though unfortunately partly destroyed by later buildings. Although we thought it may have been associated with storage, we did not imagine that grain could flow from the compartment into the gutter. Hence, its interpretation remained open.

Anybody who has seen a madbassa might have immediately recognised this one, and that is why we propose this interpretation today. However, archaeology needs clues. Samples should have been taken and analyzed, and more work done on the spot to confirm the link between the gutter and the inner floor of the compartment. In their absence, identification of this structure as an early madbassa remains only probable. With a better knowledge of 3rd millennium economy, as revealed in chapter 6, date storage and processing are obvious and come as an additional indication, but not as fully demonstrated evidence. ❑

Chapter 7

Trade and the Beginning of Seafaring in the Indian Ocean

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The establishment of oases was a true revolution with long-lasting effects. Oman was radically transformed by this, culturally, and in the forms of its landscape. By diverting large stocks of available water into a few areas given over to crops and trees, the environmental discontinuities of the country were radically increased. Crops and herds, but not people, became physically separated in these two geographical compartments. We ought to underline that throughout its history Oman would know many divisions among its people, but not the conflicts between pastoralists and farmers that troubled most countries of the Near East beyond the northern frontiers of Arabia. Many reasons can be claimed for this long-lasting integration between the two economies, but in general they can be reduced to the fact that the same people carried out both farming and herding. The explanation is to be sought in the social and political structures that allowed divisions of labour without breaking the earlier lineage and family bonds. This is not what happened in most of the countries around Arabia, where urbanism and hierarchical states were the outcomes of prehistoric evolution. We only need to look at India to see the deep differences of the Arabians from their neighbours. In India, the rich tapestry of practical divisions among

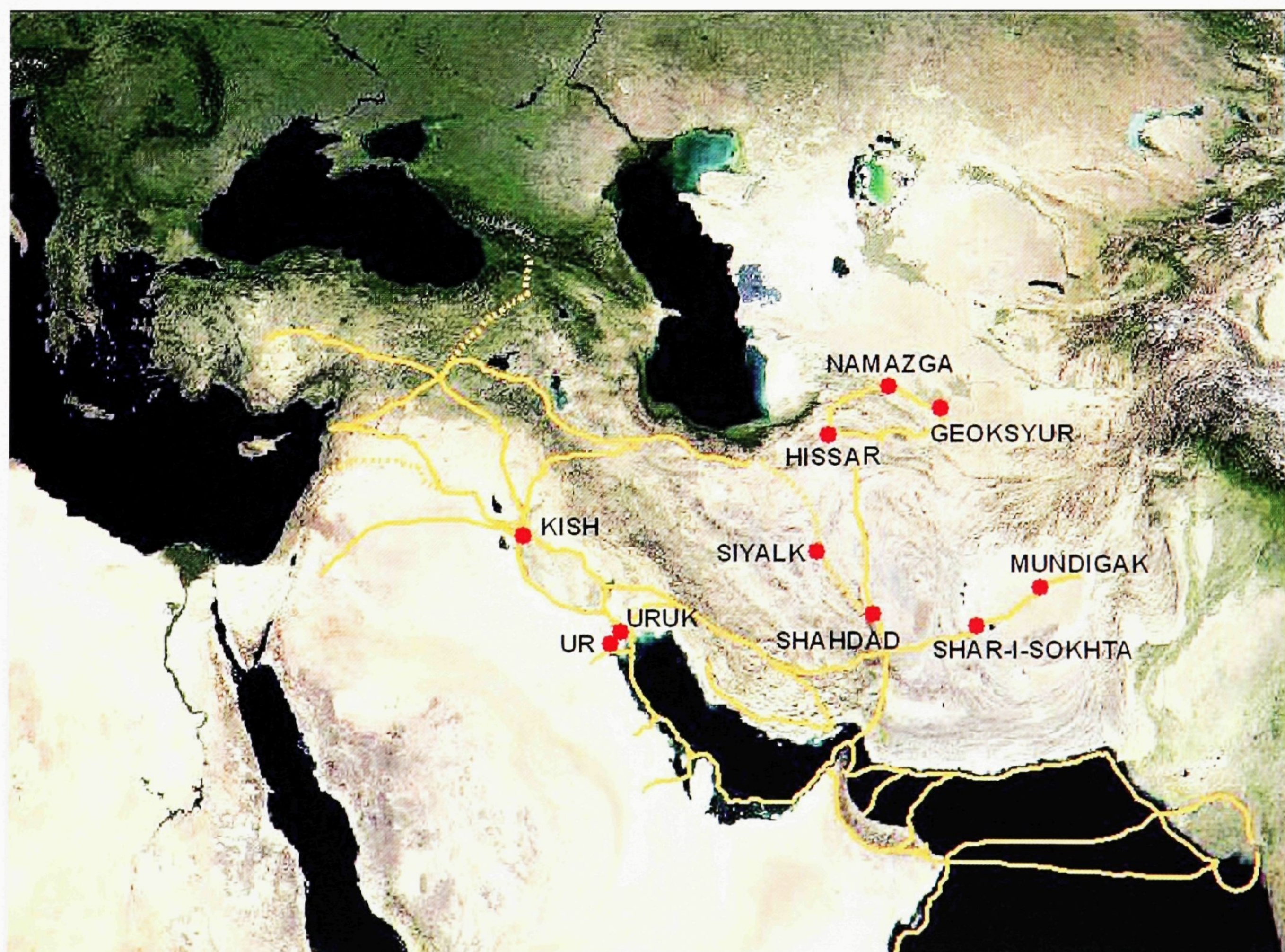


Figure 172 – The Bronze Age web: trade routes across Iran, the Gulf and the Arabian Sea during the 3rd millennium BC. The map confirms that already at this early stage Oman/Magan played a nodal role in the system of maritime and continental highways that channelled critical resources like metals, textiles, stone, wood and spices to the extremes of the *oikumene* (map by Maurizio Tosi).

arts and crafts have turned into the most complex ideological architecture of casts that organises millions of individuals within the sealed boxes of endogamic divisions. Everybody does one job and hardly oversteps it during his lifetime. The diversity of the Arabians could be explained by the fact that, in their lifetime, male Arabians are expected and trained to carry out many different works. The Ja'alan fishermen, who so generously have assisted us during twenty years of our archaeological fieldwork, used to combine this activity with a job in the city and the curing of palm trees in the Wadi Al-Batha during the monsoon. Some of them now spend half of the month in their official work and the other fishing home. Home in traditional Arabia is many places at once, according to season, need, and feelings. Mobility does not mean shifting through the physical space so much as moving across the social one, using every opportunity channelled by networks of kinship relations. Individual identity is not connected to a territory or a particular profession but to clan and tribe that extend across different natural territories and professional sectors. As already seen in chapters 5 and 6, no territorial division belongs to a single tribe, and no tribe is identified with a town, a valley, or any other piece of land. They might own it in written deeds, they might name it on maps, but the bonds of the innermost self remain to people and kinship.

The movement of people and the exchange of resources are tightly related. The abstract architecture of family and clan connections, cutting across different territories, becomes the physical conveyor for exchanging goods and ideas. Unsurprisingly, trade is regarded as "the most useful and most natural activity of mankind". The beginnings of trade in Arabia came even earlier than oases and civilisation. We have seen how during the Middle Holocene the exchange of natural resources and the first manufactured objects emerge from the archaeological record as pivotal aspects of post-Pleistocene adaptations all over the world. It becomes particularly evident in regions where the extremes of climate made it difficult for a prehistoric population to draw from the intensive exploitation of a restricted territorial division its whole subsistence and social needs. Throughout the arid environments of south-western Asia, trade, the most institutionalised form of exchange, developed at a very early stage to balance resource scarcity by integrating the diversity of small territories, and moving basic and prestige items over long distances. In Oman these early developments explain the surprisingly high level of cultural uniformity of fishermen and inland foragers already at the beginning of the fourth millennium BC when small communities living in different environments, around Muscat and in the distant coastal enclaves of the east some four hundred kilometres apart, shared the same tools, ornaments, house plans and burial rituals. The pivotal role of Oman in Early Bronze Age trade between Mesopotamia and India emerged from a long training in daily trading at local scale and regional exchanges. The more archaeological exploration brings to light the details of how people lived in villages and campsites during the third millennium BC, the more it becomes evident that international trade was only a fraction of a very active and efficient flow of local exchanges, where goods could reach the smallest household moving across mountains and desert (fig. 172).

Local Trade as a Prime Economic and Social Agent of Change.

At the end of the fourth millennium BC agricultural production and copper extraction became the main sectors of Oman's economy. Food was produced throughout the country according to different specialisations: the work of farmers, herders and fishermen maximised with great efficiency the limited potentials of natural productivity in all land environments. Exchange, facilitated by the economic permeability of local groups and regulated by the strict codes of tribal relations, transformed relative scarcity into absolute wealth. The thousands of daily local exchanges multiplied opportunities for each group and individual to expand their economic base, despite the harsh limitations imposed by climate and environment. The lack of a hierarchical order with centralised storage and redistribution facilities was no constraint on this growing trade. By mobilizing archaeological data and all available ethnographic

information, we may attempt to establish what moved across the country, what was traded, and how it linked the mosaics of biological diversity cutting across oases, steppes, desert, and coast. Unfortunately, the archaeological record has many limits and we have to resort to imagination and the indirect evidence of fragmentary clues, since perishable materials like food and textiles certainly comprised most of the trade. We end up illustrating the complexities of daily transactions from potsherds, beads and other trinkets.

The main exports from oases were undoubtedly agricultural products, with dry staple food making up the bulk, such as shipments of dates, wheat, and barley packed in baskets and bags. Honey, an Omani speciality traditionally collected wild or produced in beehives made from sections of palm trunks, would have been a highly praised durable commodity, wherever flowers attracted the bee swarms, practically unavailable in the dry regions of the coast and interior. Crops that certainly travelled around the local circuits would have included other cereals like sorghum and millet, pulses and vegetable oils. The relative abundance of grass allowed people to raise livestock within and around cultivated areas, producing milk and dairy products of longer duration like *ghee* and dry cheeses. Even today in urban Muscat, the traditional home made ghee from clarified butter is traded among households. Cattle were a source of important commodities other than food, with leather a prime example. Also sheep could be raised in large flocks of economic significance around oases to produce further dairy products and wool. Primary products also provided basic materials for industrial manufactures, along with stone and metals available near many oases in the Omani mountains. Every family would participate at various levels and in different forms at each stage of the manufacturing cycle, turning the oases into craft centres of greater vitality. We expect that the majority of these industrial districts were concentrated in the core areas of Oman, around the Jabal Al-Akhdar or in the main upstream oases of the north and the Sharqiyah. Since most have been buried or destroyed by later settlements, and very little systematic exploration has been carried out in the relevant areas, we have still not found a pottery or metal-working site in the whole of the country. Perhaps still under the influence of Iran and other major areas of the Middle East, where early craft developed in specialised areas creating large concentrations of remains, archaeologists might have been looking in the wrong way at the Omani evidence. Gerd Weisgerber, head of the German Archaeomining Project in Oman, found that related



Figure 173: A coppersmith's workshop at the foot of the late 3rd millennium tower at Hili 8, ca. 2300 BC (photo French Archaeological Mission to Abu Dhabi).



Figure 174:
Items from a cold hammering metallurgy workshop in period III at Ra's Al-Jinz RJ-2, ca. 2300-2200 BC (photo Joint Hadd Project).

manufacturing activities, including the smelting of ores, was spread among many sites and organised around small workshops, often in courtyards, or in other open areas within the settlements (window 8). At Hili 8 such coppersmith workshops were found just outside the tower and dated to different phases between 2400 and 2200 BC (fig. 173). Metal was commonly used in Oman throughout the Early Bronze Age for all kinds of activities and ornaments; but for understanding its economy, we should emphasise that it was also worked everywhere, mostly at a household level. For the tribal organisations, everything functioned at a very local level, with households and villages tending to operate as independent units of production. Not surprisingly, after almost thirty years of exploration, we have not yet found in Oman a 3rd millennium settlement with significant concentrations of slag and other craft indicators so frequent in contemporary urban areas within Iran, the Indus civilisation or Egypt. Slag from pottery and metal, however, is found in small quantities among the debris of house compounds, some here, some there, documenting every stage of the manufacturing process. Even at a seasonal fishing village like RJ-2 at Ra's Al-Jinz we recovered the remains of a little smelting activity and the leftovers of tool making by cleavage and cold hammering (fig. 174). We should not underestimate family workshops: in the industrial organisation of any developed country of Europe and Asia entire manufacturing sectors or critical segments of complex artefacts like cars are allocated to domestic working. The carpet industries in Kerman or the pashmina of Kashmir, both established during the nineteenth century were able to meet a vast demand from the emerging bourgeoisie of Europe, but they were based on hundreds of looms spread around villages and run at family level. All arts and crafts

before the industrial revolution were organised on a master-apprentice relationship replicating family bonds of linear loyalty. If there is no evidence in Oman of large manufacturing areas it might be because industrial production was basically decentralised at a household level, and such a situation would further stress the importance of local or regional trade. Copper was moved around villages and campsites in small amounts, but on a regular basis, cut from ingots in bars, lumps and smaller divisions. A hoard that might represent this kind of shipment was found at Al-Moyassar in Wadi Samad (see window 7.3).

The scattered and ephemeral vegetation of the steppes and deserts that separated the oases was made productive by desert stock breeders, who participated in regional trade like everyone else. It is possible that these pastoralists also moved the bulk of the goods to the most peripheral areas, acting effectively as small transporters and entrepreneurs. Camels would not have been available until later in the second millennium BC and goods were carried together with tents and other nomad gear by donkeys or humans. However, pastoralists produced many important goods themselves - food first of all, in the form of livestock, goats and sheep with their kids and lambs, dairy products, dried meat and skins. The main product they supplied must have been wool, but we cannot say if it was spun or sold raw. The textile industry must have been fairly developed in Oman during the Bronze Age, as elsewhere in the Middle East. Its products were probably only for local consumption and mostly manufactured at family level too. Fine cloth and beautiful textiles probably feature among the first items on the list of imports from either India or the Near East: there are no textiles among the many products of Magan brought to Mesopotamia and accounted for in the cuneiform texts.

Those pastoralists who exploited the desert areas outside the agricultural centres could still gather wild plants and animals, introducing them into the



Figure 175:
Selling smoked fish in Ibra Suq, November 1977. The large Carangidae at the front are carefully laid on a bed of ashes and salt, probably brought with the original packing to keep the cured fish in good condition. The smaller fish on the paper behind, probably a snapper, is a frequent food on the tables of all Omanis. It has also been smoked and packed in the ash and salt (photo Serge Cleuziou)

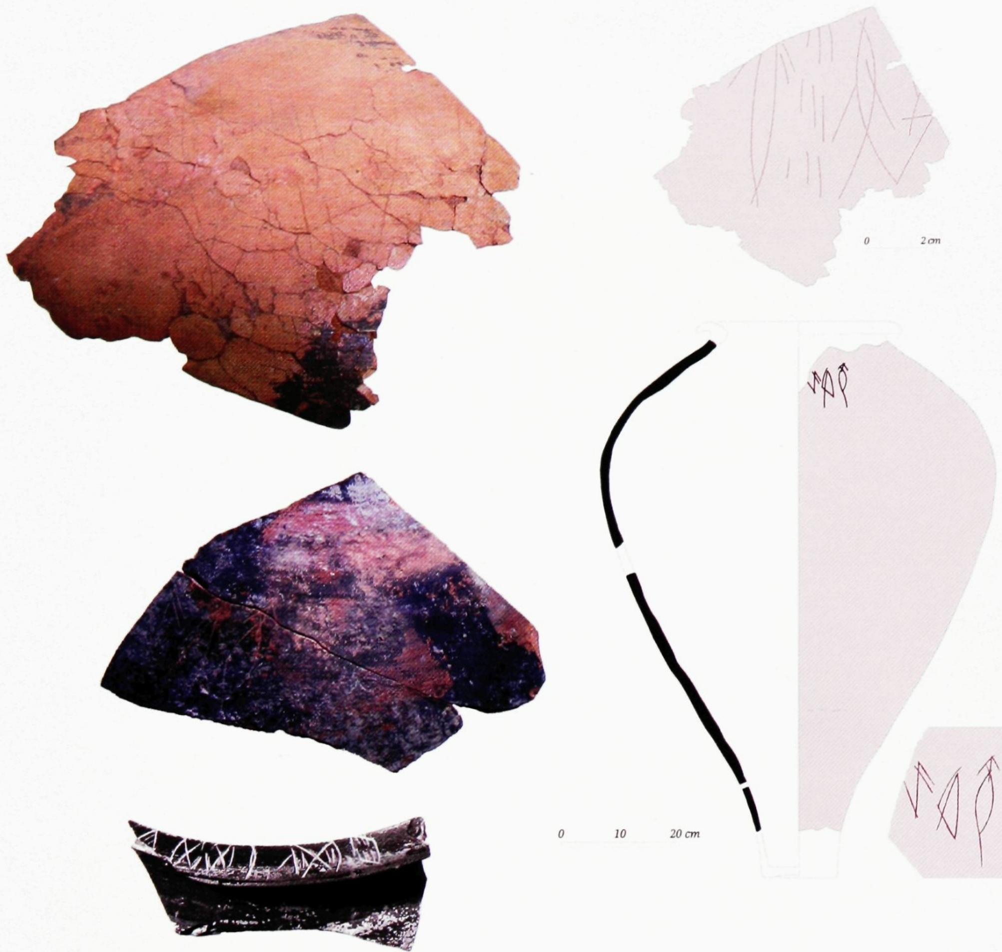


Figure 176:
Sherds with engraved signs of the Indus valley script found at Ra's Al-Jinz.1. was discovered on the surface of site RJ-2 at Ra's al-Jinz on December 25th 1981 at the start of the Joint Hadd Project; 2. was discovered in a layer of Building I dated to the 24th century BC, with enough associated pieces to rebuild the profile of the complete vessel; 3 is an inscription of a similar vessel found in the Indus valley; 4. is an inscribed rimsherd from India. Unfortunately, the signs cannot yet be read. Scratched on the vessel's surface after firing, they may indicate a quantity, a product, an owner, a destination or ... anything else!

regional circuits of exchange. They probably hunted out the last of the desert fauna that had represented the principal subsistence resources during the Early Holocene: wild camels and asses, gazelle, oryx and ostriches. The goods they could collect from the desert ranged from ostrich egg shells to salt from the dry lacustrine beds around the edges of the Rub' al-Khali, like the sebkha of the Umm as-Samin. Wild plants for medicine and sorcery certainly represented an important addition to pastoralist income and prestige. All these goods could be transported in small bundles or bags carried by thin lines of donkeys and people - the first caravans of Arabia that opened the way for the camel trains to come.

The backbone of regional trade in Oman was made by exchange between oases and the coast, along channels that integrated the resources of agriculture and crafts from the interior with the wealth of products from the sea. Every bay, lagoon or headland along the coastlands of Oman was settled for at least part of the year to exploit the bountiful marine biomass. Once more the main object of trade was food, mostly fish cured by drying, salting and smoking (fig. 175). This is something every Omani knows about. Dried fish packed in pots and baskets travelled everywhere to the interior, providing an easy and inexpensive source of protein even for the table of the poorest. But as long as fish is in the sea, it is not an economic resource because it must be caught and preserved over time to be transported. Exploration of the prehistoric coastal sites of the Ja'alan, one of Oman's main fishing areas, indicates that the catching and preparation of fish for non-local consumption began before 3000 BC. When the mud-brick houses excavated at RJ-2 were first built, around 2500 BC, it was already a major activity and large-scale fishing and curing were the main reason for the settlement being there. Finds indicate that fish was both dried and smoked. The area excavated just outside the northern wall of building II revealed the seasonal deposition of bones left by the filetting of fish before drying and salting (fig. 244). The empty space between the northern and southern building compounds was instead filled with the remains of many fish-smoking installations, made by platforms of loose stones set in shallow pits. The

remains of large and small fish specimens were everywhere dispersed in the grey deposits of burnt sand and stones mixed with charcoal (fig. 243).

The fish was probably packed into baskets of the kind found in fragments both at HD-6 and RJ-2, as it has been ever since. There is, however, an interesting possibility that the fishermen might have used pots as well, and in particular the containers of imported goods from overseas. These pots were certainly abundant at Ra's Al-Hadd and other places where boats from India had landed with their cargo. Many were cracked and could not be re-used, but they were still waterproof containers of high quality, often of considerable size, not produced in Oman at that time (fig. 175, 207, see window 7.3). Some of the jars had a capacity of 50 kg, and very few of them must have gone back to India, since Oman's main outbound commodity was probably dates packed in baskets and copper in bars and ingots. Most of the Harappan pots were then re-used locally: at RJ-2 they make up about 30% of the pottery sherds found on the site. What is particularly relevant to the question of regional trade is that Harappan potsherds have been found throughout Oman in all kinds of places, including the most remote campsites of the interior.

At Ra's Ghanada on the Gulf coast they are found among the debris of a fishing and dugong slaughtering campsite almost without structures, while at Asimah a large number appear in a remote mountain valley. They travelled through the country and were re-used as containers mostly used for products unrelated to the Indian trade. It is quite likely that many began their journey to the interior carrying salted or smoked fish from the coast. Once the fish was eaten, the pot continued to be used, either locally or to ship other products further inland. It is a remarkable case of articulation between international and local trade circuits. Had we not critically considered the question, we would have concluded that Indians had reached every part of Oman and spoken of an "invasion", as it was customary to do in archaeology before World War II. We got the idea one Friday morning in April 1992 when visiting the fish market



Figure 177:
The everlasting habit of reusing containers: salting and packing the filleted meat of tuna fish near the beach at Quriyat, in 1992. Once sliced to allow salt through, the chunks are tightly packed to fill reused tin cans that entered Oman containing ghee coming from Mumbai. Notice that children are active hands in such economic activity (photo Maurizio Tosi).



Figure 178 – Workshop for the making of shell-rings (Building IX, room 9) at Ra's Al-Jinz RJ-2, dated ca. 2200 BC. It contained chipped off apexes of Conus sp. shells (left and centre) and cut circular pieces of pearl oyster: Pinctada margaritifera (centre and right). The stone and flint pieces nearby may have been part of the tools used in the process (photo Joint Hadd Project).

in Quriyat. On holiday, the roofed area was empty except for a small group of men salting and packing bonitos (fig. 177). Each fish was split, the fillets removed and cut into smaller pieces, and then sliced through to be filled and covered with raw salt. The salt was also crushed here, using flat pebbles identical to those found at all prehistoric sites. The chunks of salted fish were packed inside five gallon tin cans, and, to our amusement, the tin cans still bore their original labels: they announced ghee from Bombay.

Marine products that moved through the circuits of regional trade included the skins of sharks and dugongs, the first to be used as the most effective abraders for woodworking known in ancient times, the second to produce the finest leather from which in traditional Oman fishermen made shoes and bags. Salt from the edge of the lagoons certainly filled part of the shipments, too, although this is still difficult to prove, and we should consider the fact that land salt from the Harassis, that was the main source of salt for fish curing in the recent past, could already have been traded too. Salt is a necessary and important item of trade, but its extraction and exchange remain difficult to detect by archaeologists. Two other important products were oils and fat. The bodies of the larger marine creatures like fish, turtles, and in particular all the sea mammals, contain high percentages of fat and the oil that can be extracted from the flesh, the tissues under the skin, and various organs. This oil had many uses. It burns brightly and slowly and was probably the main fuel for lamps: a single dugong may produce as much as fifty kilograms of oil, enough to light a small house for a year. While dugongs were a major source of it from the Gulf coast, where they live in large herds, dolphins could also supply it from the waters of the Arabian Sea. We know that both animals were



Figure 179:
Conus sp. shell rings at various stages of their manufacture. The wall and columella were cut off the shell (upper left), leaving the disc-shaped apex that was ground until it was shaped into a ring (bottom right). All these items come from Building I room 4, ca. 2350 BC, with the exception of the finished ring that was found in a grave nearby (photo Joint Hadd Project / Vincent Charpentier).

extensively killed during the Bronze Age at all coastal sites excavated so far (at Ra's Al-Hadd HD-6 for instance), indicating that since the fourth millennium BC fish oil had become a critical commodity supplied for local and distant trade. It was certainly used for all kinds of manufactures as well, beginning with the amalgam for the caulking of boats. It was probably also a source of cooking fat, for, centuries later, Greek geographers recorded with contempt in their descriptions of the Ichtyophagoi the "fish eaters" who lived at that time on the coast of the Arabian Sea.

With the exception of food, most products from the sea travelled pretty much unrefined to help with the manufacture of finished objects and increase returns for the fishermen. Added value is essential to build up wealth from trade and we see this truth applied by the fishermen of Oman in their work with



Figure 180 – Waste pieces from the manufacture of Conus sp. shell rings clustered on the floor of room 4 in Building I, ca. 2350 BC. The majority are discarded sections of lower body where the gastropod's walls becometoo thin for the making of rings (photo Joint Hadd Project).

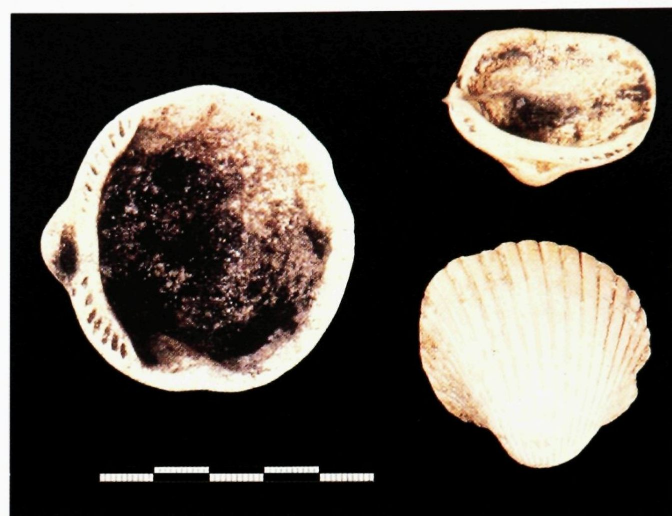


Figure 181 – Ra's Al-Jinz RJ-2. Valves of Anadara ehrenberghi shells, packed with a black streaky mixture that was analysed as an amalgam of pyrolusite (manganese dioxide, an oxidation product of weathered manganese minerals) and lime, ca. 2300 BC. Outcrops of manganese ore are located only 5 km from the site, tapped by pyrolusite. The mineral has a metallic aspect, a black or bluish-black streak that made it an ideal material for cosmetic coloring, highly appreciated in urban centers throughout the ancient Near East (photo Joint Hadd Project).

shells. In all buildings excavated at RJ-2, as well as on the surface of many Bronze and Iron Age sites on the Ja'alan coast, there are remains of shell working. Two kinds of shells were mainly involved: *Pinctada margaritifera*, which is mother-of-pearl, and different species of *Conus* sp. (fig. 178). *Pinctada*, one of the large bivalves used in the fifth and fourth millennia BC to make fish hooks, was employed at Ra's Al-Jinz RJ-2 to produce flat rings for ornaments, Also *Conus* was used to make shell-rings, but with a different manufacturing process. Pinctada made flat rings, three to six centimetres in diameter, and Conus made cylinder rings, smaller in diameter and about a centimetre high. These have been found in graves in the interior dating from the entire third millennium BC. Both types were used as ornaments, but we do not know yet whether on strings, like beads and pendants, or with some other kind of mounting. All stages of the two working processes are represented among the wasters left in almost every room and courtyard of the buildings (fig. 179), indicating that the rings were made during the fishing season, probably as a side activity, by the same fishermen or their families. It was an opportunistic

addition to the main activities carried out at the site: people had to make the most of their spare time. Time-consuming techniques were needed and the tools used, made from local chert and sandstone from nearby outcrops, were primitive but quite ingenious (fig. 180). It was probably a low-intensity activity, as one would expect, with a group of fishermen sitting by the sea at the end of the world.

Along with making the rings, the fishermen also used their free time to collect from outcrops two to ten kilometres away in the hinterland a manganese mineral called pyrolusite that they crushed and mixed in equal proportions with gypsum to make a brown cosmetic powder. It was then pressed into valves of *Glycimeris* or *Anadara ehrenberghi*, locally available cockle-shells made into a "ready for use" eye-dye just by mixing it with water (fig. 181). Here again it is to be stressed that pyrolusite as a mineral was used already locally during the fifth and fourth millennia BC, as we know from sites SWY-1 and SWY-2 at as-Suwayh. Cockle-shells filled with cosmetic powders of different kinds and colours have been a recurrent find in the Royal Graves of Ur and in other major Mesopotamian centres. Clearly not all came from the Ja'alan, but it is interesting to note that certain products originally made for regional exchange also ended up in shipments for distant trade. This happened even with shell rings that have also been found in the excavations at Ur and other major centres of the Near East, like Tell Barri in Syria.

Regional exchange and international trade were probably carried out by different agencies, according to different rules, and existed independently from each other. However, they were connected at various levels in different ways. The products circulating in one system could spill at any time into the other. We have seen the interesting case of the Harappan pots circulating in Oman as containers for cured fish, oil and other local products. Shell rings and eye-dye in cockle-shells, probably made for local consumption, could leave Oman for the big



Figure 182 – Reconstruction of a small jar with a decoration of palms and peacocks (ca. 2500-2400 BC) It was discovered smashed in room 6 of Building I at Ra's Al-Jinz (n.2). 1 and 3 have been found in the Indus Civilization area, at Harappa and Lothal respectively (Drawing by Hélène David).

cities of the West, and meanwhile most of the goods that moved through trading ports along the coast of Arabia could be diverted to the interior along the same channels, when local agents found it convenient. Anybody who has experienced, briefly, what happens on the quaysides of Arabian ports is well aware that terms of contract are rather flimsy and most transactions are on a day-by-day basis while goods may be redirected from one destination to another at any time.



Figure 183 – An olivine gabbro statue of *Gudea*, ruler (ensi) of the southern Mesopotamian city of Girsu, ca. 2200 BC. He claimed that the stone had been carried from the Land of Magan, but the precise location of these ancient mines is still a matter of speculation and we keep on looking for them on both sides of the Hormuz Straits (Louvre Museum, Paris).

In conclusion, Oman in the third millennium BC was in economic terms a highly integrated region, despite the relative simplicity of its material culture and lack of any real political centralisation. Markets existed without a state and without any evidence of an administration. If we look at the contemporary centres of Iran, the Near East and the Indus valley, seals and their sealings, as well as other archaeological indicators for record keeping, are one of the most common finds from this period. Very few seals have been found in Oman and there are no sealings at all, indicating that a complex and efficient network of exchanges was ruled on a handshakes. The tribes and local groups living in the country did not need neither money nor accountants, yet increasing economic opportunities for everybody.

The World Economy's Earliest Circuits.

Trade in bulk became a necessity with the growth of the industrial sector when the demand for metals and textiles increased in the second half of the fourth millennium BC. This in turn had been stimulated by the emergence of cities and early states in Mesopotamia and Iran. Since hierarchical control was mainly structured around the production of primary goods from land and animals, such as cereals and wool, the heartlands of early states were territories of high agrarian productivity, like alluvial lowlands and fertile highland plains. By the end of the fourth millennium BC, population and technical capacities had become concentrated in the centres of the new political orders, laying the foundations of urbanisation. In the following period, the first half of the third millennium BC, the expansion of cities in Egypt, Mesopotamia, and the Indus valley shaped the networks of communication that channelled goods and tribute. Tin and lapis lazuli are good examples of how far the search for raw materials reached into distant lands that lay beyond any possible political control. Tin, necessary for producing harder bronze alloys, was found in large quantities in the mountains of Uzbekistan along the Middle Zeravshan valley, almost three thousand kilometres

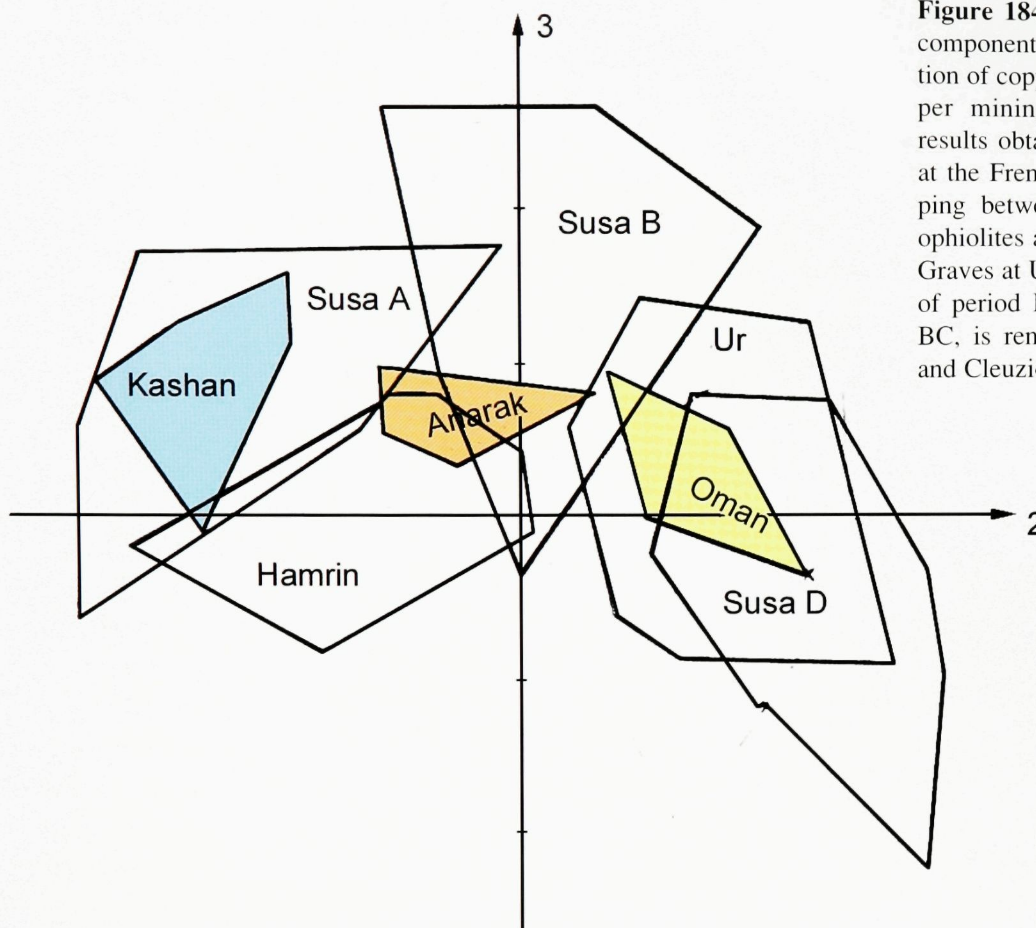


Figure 184 – Statistical diagrams (principal component analysis) comparing the composition of copper objects (empty areas) and copper mining areas (coloured areas), after results obtained by spark mass spectrometry at the French Nuclear Agency. The overlapping between the Omani copper from the ophiolites and the objects found in the Royal Graves at Ur and the contemporaneous levels of period D (our IV) at Susa, around 2600 BC, is remarkable (drawing after Berthoud and Cleuziou, see JOS 6).

to the east of Uruk and five thousand from Memphis, with almost no other occurrences in between. Lapis lazuli, the magical blue stone, travelled the same distance from the mountains of Badakhshan on the northern frontier of Afghanistan and it had already reached as far as Egypt in the first half of the fourth millennium BC. The demand by the early states for metals and other basic resources ultimately upset the political conditions of many distant peoples. We have already seen how, by the end of the fourth millennium BC, Oman had become involved in the economies of the surrounding regions and how its incorporation as a provider of copper and other minerals might have moved the earlier tribes into more complex political formations to keep the country under control. However, these revolutionary changes became visible only during the first half of the third millennium BC. During this lapse of time, while elsewhere cities grew into major centres, Oman managed to achieve a leading position in international trade, developing from a simple provider of copper into the chief intermediary between the great circuits of the East and West. This was technically accomplished by fishermen who could ride the monsoon and open the direct sea route between Arabia and India, taking advantage of their experience in ocean navigation already thousands of years old (fig. 172).

Demand of goods and raw materials from the cities growing along the Nile and on the shores of the great rivers flowing from Anatolia to the Gulf was the main engine of the economic revolution that took place in the first half of the third millennium BC. The flow of goods and people moved along two main channels: the Nile-Black Sea circuit and its Euphrates-Gulf equivalent. The first, centred on Egypt, extended south-north from Nubia across the Nile Delta and along the Eastern Mediterranean shores to Troy, and from there it could reach across the Black Sea the Kuban valley and the gold of Maikop, north of the Caucasus. The second circuit was centred on the Mesopotamian cities and moved west-east along the full length of the Euphrates, carrying timber and metals from the Anatolian highlands to the Gulf, and then further along the shores



Figure 185:
The "vase à la cachette" and its contents found at Susa in Iranian Khuzestan, and dated ca. 2600 BC, during the Susa D period. Three copper buns from Oman are in the lower right section of the picture. (Louvre Museum, Paris).

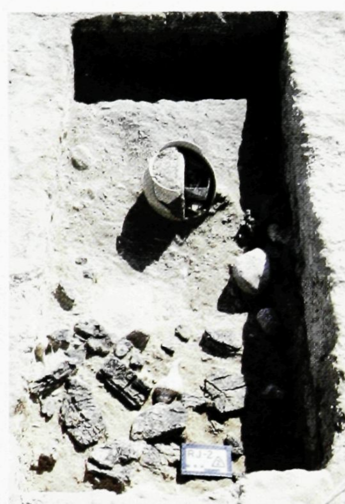


Figure 186 - The small room 2 in Building I at Ra's Al-Jinz RJ-2 under excavation in December 1985. In the foreground are fragments of a bitumen mixture with impressions of reed bundles and mats that are the remains of the coating of the hull of a seagoing vessel, scraped and stored before re-use, and several large Fasciolaria trapezium conch shells that were probably exported by sea. In the background there is a pot where a baby was buried at a later period (photo Joint Hadd Project).

of Arabia to the Middle-Asian highlands directly through eastern Iran, and to the shores of Pakistan and India. True sub-continental basins of economic integration, these circuits had existed for millennia because their regional sections had been operating from Neolithic times. With urban growth after 3000 BC, they were expanded in two different ways: by extending sideways in all directions to incorporate new lands and resources around them, and by connecting with each other to form vast continental systems. It is evident that whoever could make and control these connections would be granted exceptional opportunities for wealth and power. During the third millennium BC, this was the case with Syria and the Levant that articulated the Euphrates circuit with the Nile-Black Sea one; and it was also the case with Eastern Arabia, when the mariners of Oman established the direct seaway to Kutch, Gujarat and the immense Indian hinterlands.

Another major interregional circuit, only recently discovered by archaeological exploration, had been built in late Neolithic times between Central Asia and Northern India across the mountains of the Hindu Kush and along the winding Indo-Iranian borderlands. These connections integrated a diversified system of complex political formations that had



Figure 187: Two *Fasciolaria trapezium* conch shells cut as drinking vessels found in the Royal Graves of Ur. They are engraved with the name of the Sumerian king Rimush (ca 2600-2500 BC). Such vessels are not found in the Gulf and certainly originate from the Sea of Oman, possibly even from Ra's Al-Jinz or Ra's al-Hadd! (The British Museum, London).



Figure 188: A chlorite vessel was found complete with its lid in an Umm an-Nar funerary pit at Bahla (see chapter 8). The organic content was still present and is under analysis. According to very preliminary results, it is likely to represent some kind of cosmetic mixture (photo Joint Hadd Project).

come into existence at the same time as the Near Eastern ones in the highlands and plains of Turkmenistan, Uzbekistan, Afghanistan and Baluchistan. The Indus River and the Harappan civilisation ultimately provided the dominant outlet reaching the distant sources of lapis lazuli and tin for the integration of these systems, adding to the mineral wealth of Central Asia the exotic rarities of Northern India and conveying them via the fan of its riverine tributaries. The cities of the Indus civilisation were some of the largest in the world, endowed with the most efficient waterworks and the most advanced accomplishments in civil engineering. Millions of people between the Arabian Sea and the Himalayas came to share the same culture. Arts and crafts were highly developed and certain manufacturing establishments had reached the size of modern industrial enterprises. The fishermen of Oman and Eastern Arabia were able to place themselves as masters of the direct connection of these powerful production systems with the West for a good part of the third millennium BC. The Harappan imports found in the Ja'alan at RJ-2 and HD-1 suggest that the seaway to India was fully functional by 2500 BC.

Archaeological investigations of shell middens and other prehistoric remains in the countries on the other side of the Arabian Sea - India, Pakistan and Iran - is moving now the first timid steps, partly

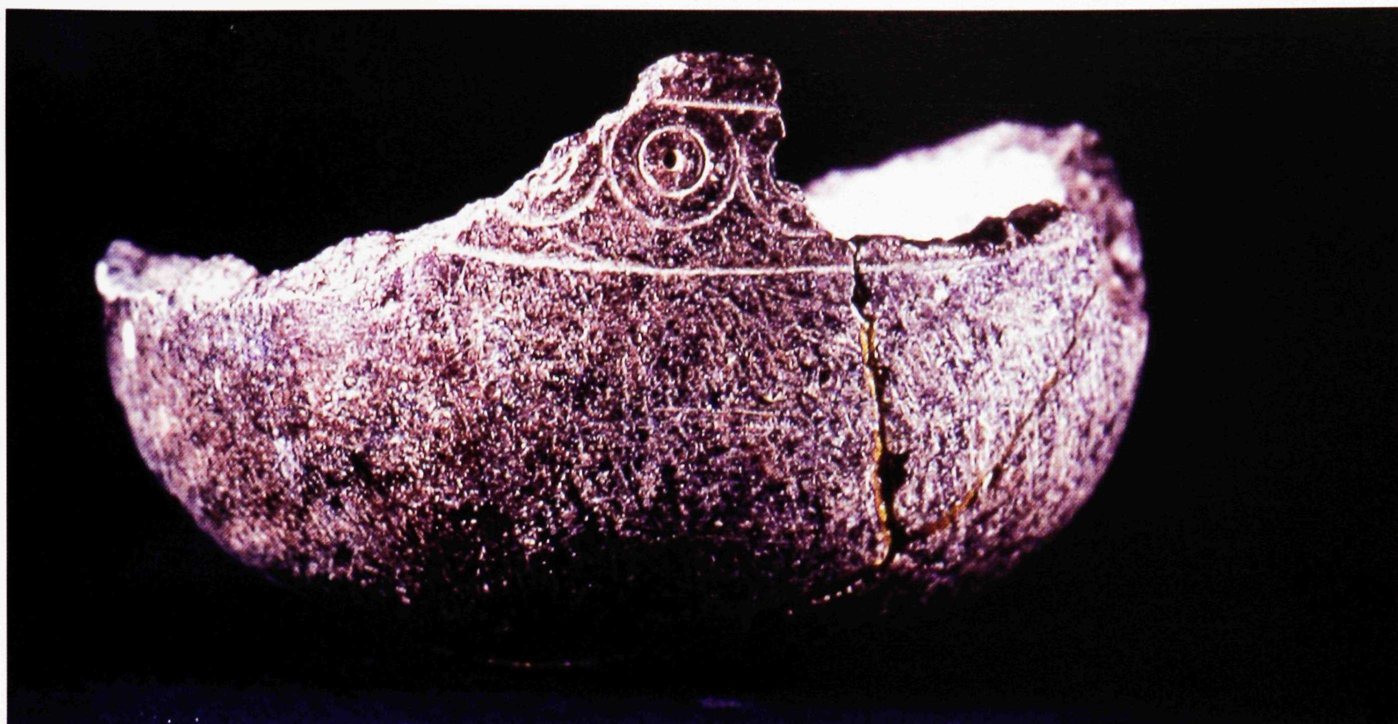


Figure 189:
An Omani steatite vessel found at Mohenjo Daro in the Indus valley (Pakistan). Museum of Mohenjo Daro (Photo RTWH Project, Aachen).

stimulated by the imposing evidence gathered in Oman over the past thirty years. However we may expect that in a few years there will be a parallel evidence available for comparative studies. There are no doubts that Indians and the other populations between Maharashtra and Iran adapted to live out of the ocean's biomass participated during the Bronze Age in the early maritime enterprises aside the Arabs of Oman. Together by sharing knowledge and experiences in a web of intersecting exchanges and alliances those early mariners created the technical bases for ocean navigation. The distribution of ceramics, ornaments and other artefacts between the urban centres of the Near East and the Indus Civilization indicates beyond doubt that by the end of the 3rd millennium BC ships were regularly sailing across the Arabian Sea. Goods, and not just trinkets and preciosities but cargoes of food, including living animals, people and materials in bulk, could be transported on those ships, looming the primeval core of the great Indian Ocean trade routes open historical times to supply Europe and the Mediterranean with the treasures of the Orient: frankincense, pearls, silk, ivory, muslin, pepper, spices, sugar and the many other exotic products that have always made the worthy difference for the wealthy and the powerful.

The Lands on the Lower Sea.

Our information on the long distance trade that connected Mesopotamia with the East derives from cuneiform texts that report on the lands of Dilmun, Magan, and Meluhha encountered when sailing



Figure 190:
A large stone building of the mid-3rd millennium BC, interpreted as a "warehouse", under excavation at Umm an-Nar (Abu Dhabi) by the Danish archaeological team (after Frifelt, 1995).



Figure 191:
Impression of a cylinder seal on a large jar from Northern Syria found in the "warehouse" at Umm an-Nar near Abu Dhabi. It is dated ca. 2500-2400 BC (photo by Karen Frifelt).

across the Lower Sea (the Gulf) and the goods they sent to the cities of Sumer and Akkad. Unfortunately, they contain minimal information about these countries themselves, and their identification has long been a subject of dispute among specialists. Over the past fifty years, however, archaeological research in the Gulf, in Oman, and on the coast of Pakistan has produced significant progress in our knowledge. We may confidently recognise Dilmun as encompassing the coastlands and islands between Kuwait and Qatar, extending to the oases of al-Hasa in the interior, while Magan indicated the whole of northern Oman, although some specialists consider that it might also at times have included portions of land to the north of Musandam. The precise location of Meluhha, "somewhere to the East of Arabia", is far more elusive. Considering the list of goods coming out of it, most scholars agree that this ancient name corresponds to the Indus civilisation, which, in the middle of the third millennium BC, extended continuously along the coasts of Pakistan and India for some 1600 kilometres, from the Iranian border to the deltas of the Tapti and Narmada in Deccan. Many small and medium-size sites have been discovered on headlands and lagoons that might have been involved in the Gulf trade. From one of them, Lothal, at the foot of Kambat Bay in Gujarat, came a stamp seal from Dilmun and another cut from a steatite rectangular lid, resembling in shape a seal from Ra's Al-Jinz RJ-2 in Oman (fig. 254). In the history of India the region most open to the sea and maritime trade has been Gujarat with its centre of gravity in Kutch, the immense lagoonal embayment fed by the easternmost outlets of the Indus delta. Here, on a small island, Indian archaeologists are digging up the remains of Dholavira, a very large Harappan city over one hundred and fifty hectares in area and full of factories and other facilities. It is surrounded by marshes but has no farmlands. It was in a way the first "city" ever built on the shores of the Indian Ocean and it is very likely that the Mesopotamians knew about it. If Meluhha was a real place in space, then Dholavira would have been its centre.

Fortunately, the cuneiform texts tell us much more about the goods that came and went, allowing some speculation about the mechanisms of Early Bronze Age trade. We are informed that bulk commodities were dates and fish from Dilmun and copper and wood from Magan; but from Meluhha it is more difficult to spell out the primary articles of trade. The lists include many exotic and precious materials, like two typical Indian stones, carnelian and chalcedony, rare woods like rosewood (*Dalbergia sissoo*), ebony and mangrove, quite properly called in Sumerian "gis-ab-ba", wood of the sea or large reeds, (gal-gi) probably a name for

bamboo, and rare distinctively Indian creatures, like peacocks, monkeys, cockerels, and once a bull that might have been a water buffalo: we know from Akkadian seal carvings that this animal became known in Mesopotamia around 2300 BC. Mention of the cockerel, literally called the "francolin of Meluhha", might be even more important for the history of mankind. The domestic chicken originated from the breeding of wild fowl in Northern India during prehistoric times. It came to the Near East through maritime trade also during the second half of the third millennium BC. Significantly, the bone of a domestic chicken has been identified among the faunal remains at RJ-2 in Ra's Al-Jinz, the first landing point for craft sailing westbound out of India. This must have been a keypoint in the bird's triumphant march towards Europe, where it arrived in the Iron Age, before it became in the late 20th century a basic food for billions globally.

Each of the three places mentioned in the cuneiform texts could have operated as agent and outlet for wider hinterlands that included many other regions. Dilmun shipped to Mesopotamia precious stones and bulk goods like wool and linens from Elam and the Iranian highlands beyond it, as well as articles, including copper from Meluhha and Magan. In turn, Magan re-exported Meluhha goods and sourced directly sissoo wood growing in the valleys of Makran and Baluchistan. However, what most directly confirms the importance of the Indian sea lanes opened at the beginning of the third millennium BC and probably used by Arabian boats, is the geographical depth of the articles listed as coming from Meluhha but originating from far beyond the Indus valley in the mountains of Central Asia and the hills of Baluchistan. They include lapis lazuli, turquoise, gold, silver, copper, and *annaku*, with the tin from Afghanistan and the Zeravshan valley even reaching the western frontiers of China. By connect-

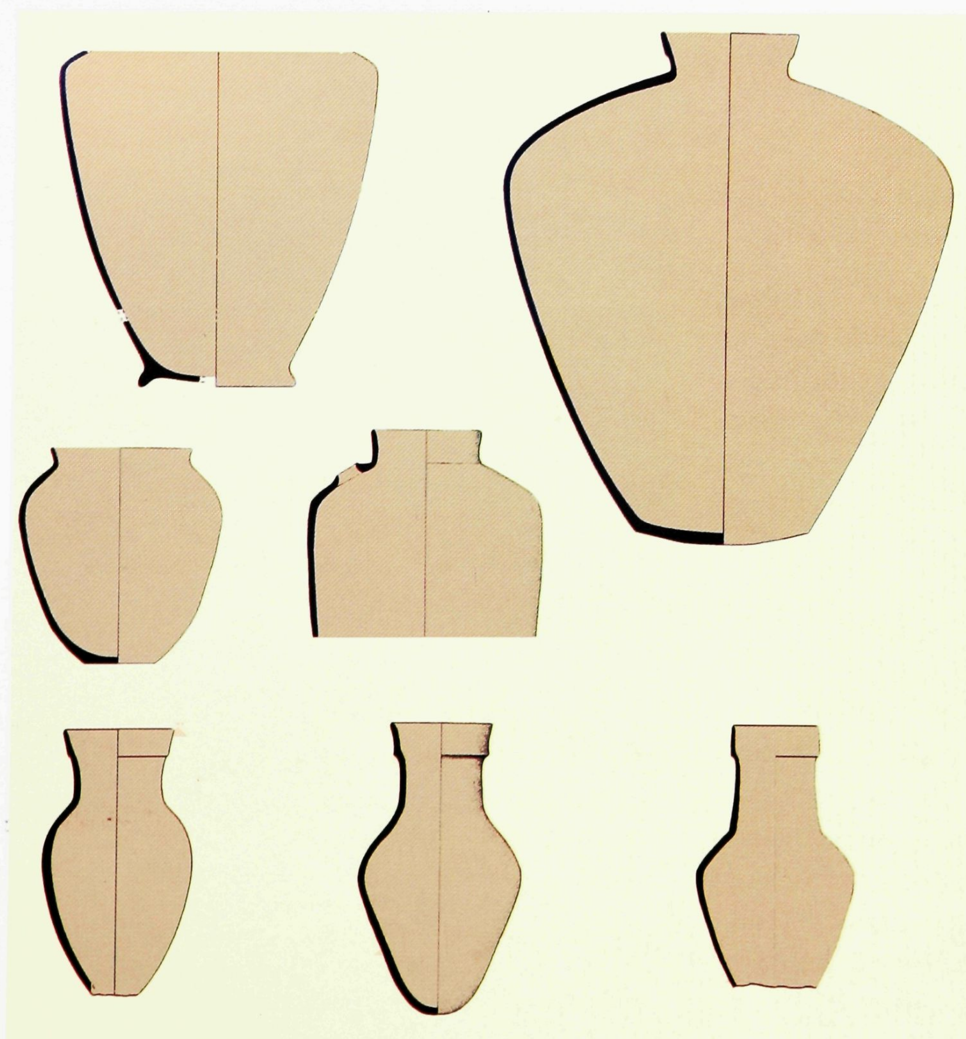


Figure 192: Storage vessels of Mesopotamian origin found in the "warehouse" and settlement at Umm an-Nar, mid-3rd millennium BC (Drawing by Hélène David, after Frifelt 1996).

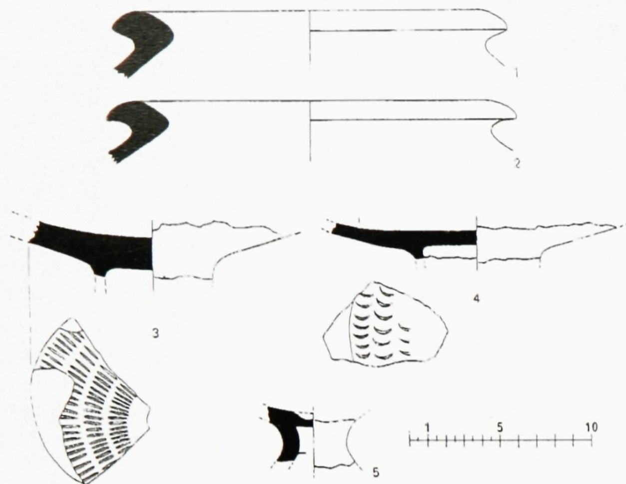


Figure 193 – Sherds of Indus valley pottery found at Hili 8 in periods IIc2-IId, ca. 2500-2400 BC. n.1 and 2 are the rims of large storage or transport jars of Indus origin. n.5 is part of a pedestalled cup of Indus origin. n.3 and 4 are imitations of the same pedestalled cups, but made in local ware (Drawing Philippe Gouin).

ing the two sub-continental systems of Northern India and the Near East, the seaway between Ra's Al-Hadd and Gujarat opened an alternative outlet for the precious metals and stones of Central Asia brought down from the heart of the continental landmass along the Indus corridor.

Trading with the Land of Magan

When we combine all the information related to the Magan trade from different texts dating between the middle and end of the third millennium BC, Oman appears to have sent to Mesopotamia three main groups of commodities: minerals, wood and marine products. This suggests that the tribes participated in international trade while being mostly involved in the daily transactions of local exchanges. The mineral resources are copper and different metamorphic rocks used for sculptures and the most luxurious artworks that have been generically called "diorite". Both copper and these stones are embedded in the ophiolithic belts that make the backbone of the Omani mountains. All major oases lay less than twenty kilometres from the outcrops of these minerals or at least near the sources of several of them. This means that there was no particular centre that could take advantage of the long distance trade. Presumably all the local groups, settlers and nomads alike, shared the wealth derived from the shipments of their goods and products outside the country. Undoubtedly international trade might have contributed to increasing the political and economic cohesion of the whole country.

Copper from Magan during the 3rd millennium BC is one of the most widely discussed issues in Gulf archaeology. In 1928 a British assyriologist, R.H. Peake, first suggested an Omani origin for the copper that had been used to cast the many sophisticated objects brought to light by Sir Leonard Woolley in the Royal Graves at Ur, following their chemical analysis by C.H. Desch. The origins of copper exploitation in Oman have already been addressed in chapter 4, but they are worth mentioning again in relation to international trade. Copper ores had already been exploited since the 6th millennium BC on the other side of the Strait of Hormuz, and chemical studies have demonstrated that in these early periods the copper used in Mesopotamia and at Susa, the powerful rival city of Uruk in Khuzestan, originated from the Iranian copper belt in the Zagros mountains. Considering that among the transformations in Oman that mark the beginning of the Early Bronze Age copper is associated with the appearance of other Iranian technologies, like ceramics of the fine painted black-on-red type,



Figure 194:
Ra's Al-Jinz RJ-2, pottery sherd of Mesopotamian origin with a bitumen coating. Such vessels were probably imported with bitumen inside them, that has been chemically determined as originating from Mesopotamia. On the outer part of the sherd is a possible cuneiform sign (photo Joint Hadd Project).

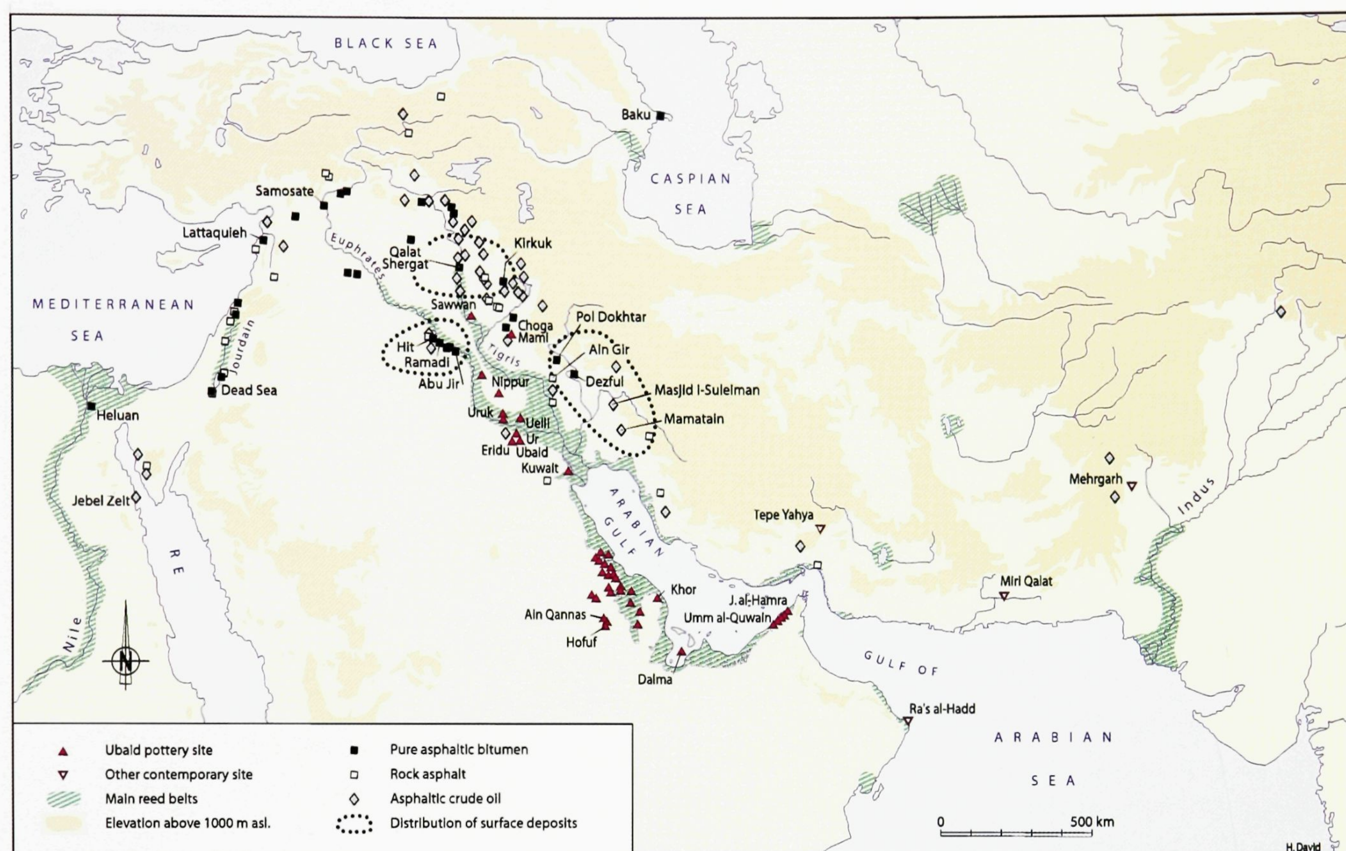


Figure 195 – Map showing the distribution of bitumen, reed belts and Ubaid sites in the ancient Middle East (drawing by Hélène David).

one may speculate that copper exploitation also came from south-eastern Iran, and possibly that the first craftsmen themselves came from there. If this was the case, two interpretations are possible. One, for long the most favoured, is that the Omani copper mines were developed from outside to meet the needs of the early states. The other, which seems more likely to us, is that the technology was imported but quickly developed by the Omani society itself to meet its own needs while entering international trade. The emerging tribal confederations of Magan, which had been successful in mastering their rugged territory and the ocean around it, could keep control of this new source of wealth, channelling it to the outside world through exchange circuits long since established in Oman and the Gulf region.

The first decipherable cuneiform texts of Uruk in southern Mesopotamia, dating from around 3300 BC, already mention copper from Dilmun; but as no copper ore can be found in the entire area related to Dilmun, from Kuwait to Qatar, we can confidently accept that it came by boat either from south-eastern Iran or the mountains of Oman. Analytical studies by a team from the French National Centre for Scientific Research have confirmed the Omani origin of copper objects dated ca. 2750 BC from Ur and Susa (fig. 184). Sophisticated tools, weapons and vessels were found there, stocked in a large painted jar, the "vase à la cachette", now at the Louvre Museum in Paris, together with bun-shaped ingots similar to those produced in Oman. All were determined as coming from Oman after analysis of trace elements found in the metal (fig. 185). The first mention of copper from Magan, in a cuneiform text from around 2400 BC, no longer comes as a surprise. Major studies on copper production in Oman have been undertaken by a research team from the German Mining Museum in Bochum led by Gerd Weisgerber and illustrations for the Early Bronze Age are kindly summarised by him in windows 7.1 and 7.2.

The different kinds of wood exported from Magan are mentioned either as unspecified construction or as finished carpentry products, includ-

ing furniture pieces like tables, thrones and boats. Palms and two different kinds of reed are also listed and might have been used with the wood for boat building, as suggested by specific texts on water-craft. In one particular tablet written in Akkadian there is mention of a bird brought from Magan called *Haribu*. Specialists in cuneiform have translated it as "crow", but this most common bird makes a very unlikely article for trade. We believe instead that the text refers to another black bird, the cormorant (*Phalacrocorax carbo*). Even now, flights of more than fifty thousand cormorants are seen crossing Arabia during their seasonal migrations. Although these birds are not very palatable to our modern taste, cormorant bones have been found in several prehistoric sites in Oman, the Gulf and Eastern Iran. It is also possible that during the third millennium BC they were more or less domesticated and trained as tethered dive-fishers, a sporting activity still common in many countries of South East Asia. For the Mesopotamian elites it would have made an amusing curiosity that they might have been ready to pay for. Far more difficult to explain is mention on another tablet of a *shakhu*, a "pig", from Magan. Since *Sus scrofa*, the pig, never lived wild in the Arabian peninsula, the text might have meant the re-exporting of another wild animal from India. We still have no clue about what animal it could be. We should always remember that, faced with strange foreign creatures, fantasy may operate in giving odd names. There is little or no physical similarity between a pig and a guinea pig!

Marine products recorded in the texts as coming from Magan occur all over Oman from the coastal regions in the west, north and east. The Mesopotamian lists include turtles, shark skins, shells, and many other products bearing names we are unable to recognise immediately. With time archaeology might provide some of the answers. So far most of the information has come from two of the most distant points, Ra's Al-Hadd and Ra's Al-Jinz. We have already mentioned the shell rings and the pyrolusite eye-dye packed in cockle-shells. A third very interesting indication has come from Building I at Ra's Al-Jinz RJ-2 where, in a small storage room (fig. 182), were grouped several intact and unworked large conch shells of Fasciolaria trapezium. Identical specimens, finely cut into a boat-like shape, and in some cases carved with decorated incisions and inlayed with lapis lazuli, were found at Ur in the Royal Graves that date approximately from the same time as the first buildings at RJ-2. Sir Leonard Woolley, the excavator of Ur in the twenties, thought they were lamps, but all later research has failed to find any deposits or fire traces to con-



Figure 196: Model of a reed boat covered with bitumen. Several of these were found in the royal graves of Ur in Mesopotamia and can be dated to the mid-3rd millennium BC (the British Museum).



Figure 197: Fragments of bitumen with reed bundles and mat impressions found in building I room 2, ca 2350 BC (photo Joint Hadd Project).

firm his interpretation. An alternative proposal is that they were fancy drinking vessels used in banquets, like the rythons of the ancient Greeks or the horns of the Vikings (fig. 187). Shells of *Fasciolaria trapezium* occur on the beaches and in shallow waters all along the coast of the Arabian Sea, and there is no reason to believe that those from RJ-2 were exclusively collected for the Mesopotamian market. Like pyrolusite and shell rings, they were probably an article traded locally but at times also traded internationally.

The articles listed in Mesopotamian texts indicate that Magan was a fairly developed country that sent to Dilmun and to Mesopotamia not only raw materials and semi-worked commodities but also specialised workers, tools, and products of its industries. This is indicated by the mention of á-gurus, interpreted as specialised workers who were moved to a location in Dilmun. If we consider the leading industrial sectors of Oman at this time, the term "workers" could have meant miners, metalsmiths, stone cutters, or ship builders, in any case people who had undoubtedly special skills to sell. The tools mentioned in the trade are stone-made and indicate picks, chisels and large anvils brought to Dilmun and further on to the city of Lagash in Southern Mesopotamia. The information from the texts is too scanty for us to elaborate further.

Archaeology tells us that another characteristic product of Omani industries in the second half of the third millennium BC travelled both to Mesopotamia and the Indus: the soapstone (chlorite) bowls and vessels decorated with the typical dot-and-circle motif (fig. 188). They were probably one of the main articles in local exchange, as they are found in every grave and settlements from this period. We suppose that they were deposited in the graves as containers for some kind of food, and, considering their shape, this could have been a solid or semi-liquid preparation. By analogy with modern use, one may tentatively suggest a material like honey or any kind of date preparation, like modern *halwa*. We are dealing with confections of high added value packed in expensive containers, the key to successful trade. Scents, even more expensive, may be another possible content, recalling Amouage perfume being traded in crystal and gold *khanjar*-like flasks. Outside Oman, similar chlorite vessels have been found in all the areas involved in the Gulf and Indian trade from the Mesopotamian cities and Susa to Iran,



Figure 198 – Impression of a reed mat on a piece of bitumen. Note also the ropes joined into a knot that were used to attach the mat to the inner structure of the boat that was made of reed bundles (drawing by Hélène David)

Baluchistan and, based on a single find at Mohenjo Daro, in the heartlands of the Indus civilisation (fig. 189). One of them, dated to around 2100 BC, bears a cuneiform inscription recording that it was dedicated to a temple in the Sumerian city of Lagash by a local merchant, indicating that such imports were highly valued. They are often found in the Dilmun burial mounds of Bahrain from around 2200-2000 BC and also in Mesopotamia and at Susa. We even find them in countries that produced their own soapstone vessels, with different shapes and decoration and probably for different uses, such as the few examples found among many local ones in the rich cemetery of Shahdad in south-eastern Iran. The single hemispherical bowl found in the Indus city of Mohenjo Daro is at present the sole definitely Omani object located in this region. We have here a typical example of the importance of such luxury objects for both archaeological investigation and its biases. Most of these vessels were not recognised as being of Omani origin when first found, being classified simply as "curious" objects among the large amounts of locally made handicrafts of Mesopotamia and the Indus. On the other hand, archaeologists trained in these main areas of research immediately recognise objects of Mesopotamian or Indian origin in Oman and emphasise their presence as proof of contacts and elements for dating local findings. As a matter of fact, we may assume that such vessels reached Mesopotamia and the Indus in fairly large quantities, probably alongside the main copper cargoes of the trading boats.

When using records written in Sumer, we should be aware of their many distortions. First, we know only a few of them, while we can imagine that dozens were produced every year by the nit-picking bureaucrats who controlled the movements of goods and labour in the southern Mesopotamian cities. Moreover, these texts contain only references to the main cargo; but it is well known that on such risky expeditions any valuable lightweight item that could be added was a means of extra income, although the bureaucrats would never have justified to themselves the risks or capital expense of arming a ship. In later better known periods in the history of maritime trade, this extra load of small commodities was often a privilege of crew members who could carry out a little business in the ports of call while serving on board. One of the oldest wrecks ever studied by archaeology, the Ulu Burun boat found south of the Turkish coast, displays a vivid picture of such a cargo around 1400 BC. The bulk cargo that filled the hull included 300 ox-hide copper ingots of ca. 25 kg each and a dozen tin ingots; also wine and olive oil amphorae, and, in several large jars, there were lumps of therebinth, an aromatic resin, predecessor of frankincense for rituals and scents, to an estimated amount of one metric ton. Above and around this heavy cargo was an array of different objects, evidently also intended for sale: ingots of glass, a bunch of spears, a set of Cypriot luxury pots, cut pieces of elephant and hippopotamus ivory, many different ornaments like beads of faience, glass and amber, and fine objects such as Canaanite gold and silver jewellery and a gold scarab of Egyptian origin. As already suggested for local trade, these trinkets may be even more present in the archaeological record than the main cargo itself.

Looking at the other end of the trade with Mesopotamia, let us consider now what goods came from there to Oman at this time, according to the archaeological record. One of the most significant finds was also one of the earliest. In 1962 at Umm an-Nar a potsherd was recovered during the Danish

excavations of the "warehouse" (fig. 190). It is a wall fragment from a large storage jar that had been decorated before firing with a seal impression representing a gazelle or a wild ox standing beside a stylised flower or "rosette" (fig. 191). This type of decoration made with friezes of seal impressions is known from many specimens found in the Bronze Age cities of Northern Syria like Ebla, Emar, and other major trade centres on the Middle Euphrates. The Umm an-Nar potsherd was found amidst many more broken pots brought from Mesopotamia that would have passed through the warehouse for different transactions (fig. 192). Since the circuits acted as an open conveyor, drawing products from a vast hinterland, goods came not only from the ports of southern Mesopotamia but from places beyond it as well. If we consider that at the same site of Umm an-Nar imports from Syria and Mesopotamia are mixed with potsherds from the Indus valley and a piece of lapis lazuli from Afghanistan, the latter a very rare find in Oman, the efficiency of the circuit is directly confirmed.

Mesopotamia shipped abroad varied goods and according to the texts the bulk of those sent to the East across the "Lower Sea" were different kinds of textiles, produced in the many factories owned by rich families, temple authorities and kings. For the outbound cargoes to Magan the texts also list large amounts of food items: flour, sesame oil, dried loaves of crushed barley for making beer. It is interesting to note that, in general, exports from Mesopotamia are semi-worked products with considerable added value, characteristic of more advanced political systems where larger labour forces can be harnessed under élite control. But we should be aware that the information gathered from these texts is far from complete: we will see later, for example, that bitumen, a product of critical importance for Omani navigation, also came from Mesopotamia. This export, though repeatedly identified by archaeology, has never been found in the texts.

Technologies can also be imported. We have suggested that this was the case with metallurgy, pottery, and possibly some agricultural practices. Another and very interesting case concerns dairy products. With the establishment of trade with the Indus civilisation new types of vessels appear in the

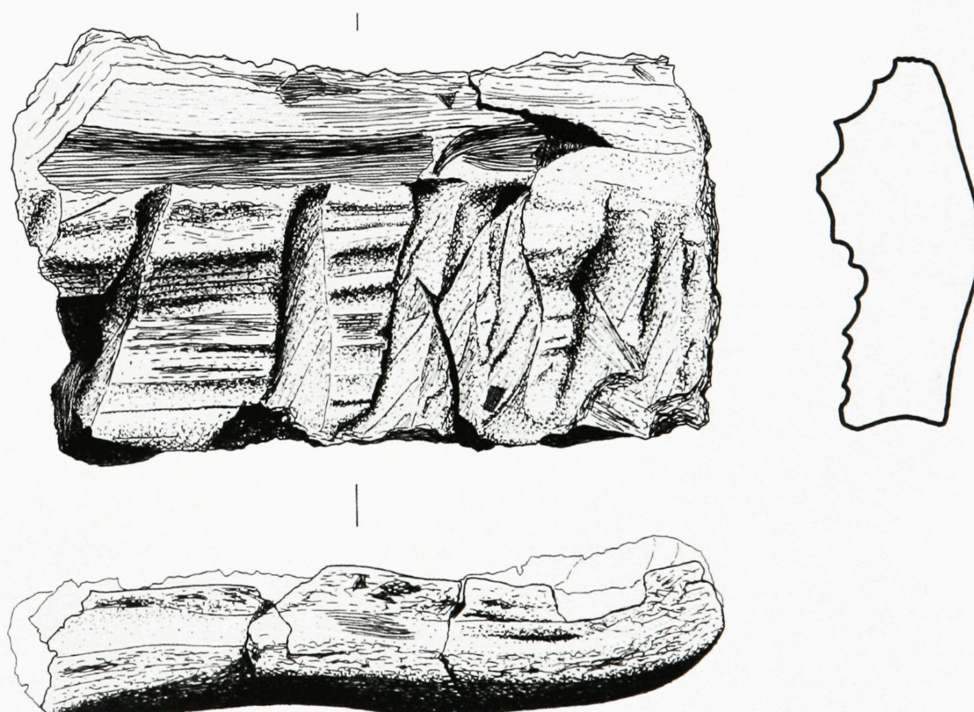


Figure 199 – On this piece of bitumen, the caulking covered directly a reed bundle that was lashed together with twisted reeds (photo Joint Project).



Figure 200:
The barnacles (Balanus amphitrites) that developed on the outer face of the caulking were the first indication that the bitumen pieces were the caulking of a seagoing boat. They have been identified as fully-grown barnacles, a clear proof that they covered a construction that had been in water for rather a long time (photo Joint Hadd Project).

Ja'alan, but also in some oases of the interior. These are perforated vessels found at Ra'sAl-Hadd, Ra's Al-Jinz, Bat, and Hili, or pedestalled cups with a "fingernail-like decoration" at the bottom, found at Maysar, Bat, and Hili (fig. 193). Such vessels are commonly linked to the making and use of dairy products. The perforated vessels are used to drain whey from boiled milk, in order to obtain curds that can be eaten directly or transformed into cheese. The pedestalled cups with a "fingernail-like decoration" are very similar to those still used in Pakistan to process *qurut*, called *kurt* in central Asia, a long conservation dried cheese found in various cooking recipes. The objects found at the coastal sites are authentic imports from the Indus valley, while those found at Maysar, Bat, and Hili are local copies. We have little doubt that dairy products had already come into use during the 4th millennium BC, but these objects are likely to represent the adoption of new ways of processing them under the influence of the Indus civilisation, where they were a major part of the food produced and consumed. It is likely that, apart from ghee, other products such as qurut-like cheese were already travelling from the Indus to Magan as early as the second part of the third millennium BC.

While the many Mesopotamian pots from Umm an-Nar may represent the packaging for goods that travelled across the sea, the very few recovered at the other end of Oman, at Ra's Al-Jinz, indicate that within the country few of them travelled in the original containers. Some thirty potsherds from large buff ware jars, found at RJ-2 throughout the Bronze Age sequence, bear traces of the bitumen they contained, while only a (small) fraction of those from Umm an-Nar indicate the same content (fig. 194). Bitumen was exported from Mesopotamia to Oman from the beginning of the fifth millennium BC, as is known from beads found in the prehistoric burial at Umm Al-Qawayn 2, and remained for the whole of the third millennium BC an indispensable base material for boat construction. Isotopic analysis of the bitumen used at RJ-2 has allowed us to identify its provenance as the spill-fountains of Hit in central Iraq, one of the main sources of bitumen throughout Mesopotamian history. Not surprisingly, such a strategic resource would be transported in its original containers throughout Oman to wherever boats were used. The largest piece of bitumen amalgam found at RJ-2 in a storage pit dated around 2250 BC, 2.7 kg in weight, is still shaped by the end section of a turtle carapace where it had been cast. If the raw bitumen travelled from Mesopotamia in large jars, once it was amalgamated and used by Omani fishermen it would travel further in all kinds of local containers for repairs and local exchange. For an econ-

omy like Oman's that relied so much on sea products for its subsistence and on the local system of exchange, to depend totally for a key component of watercraft on the erratic supplies of foreign trade would have been extremely risky. Neither bitumen nor asphalt was available throughout Eastern Arabia, save for a few mineralised outcrops in the middle of the Harassis. The closest sources alternative to Mesopotamian ones would have been the land-locked spills along the northern slopes of the Baluchistan mountains, far more difficult to reach through rugged terrain and chains of local intermediaries (fig. 195).

Oman and Early Seafaring

Eastbound boats out of Oman could leave from harbours around Ra's Al-Hadd in spring, sailing with the winds of the north-eastern monsoon. The distance to the mouth of the Rann of Kutch or the westernmost headlands of Saurashtra at Dwarka could be covered in ten to twelve days, moving at a speed of three to six knots (see window 7.5). The return trip could be done in about the same time, sailing with the south-western monsoon at the end of summer. We surmise that several boats could leave the eastern tip of Arabia each year to complete the voyage to and from the Indian harbours.

Even less known and little documented, but of major relevance for our purpose, is a fourth circuit that may have started during the fourth millennium BC along the northern rim of the Indian Ocean, linking India to East Africa by way of the coastlands of Arabia. Archaeological studies are slowly rediscovering what the American geographer Carl Sauer once called "a forgotten corridor of Mankind". This may have been the route through which lapis lazuli reached Southern Egypt as early as the middle of the fourth millennium BC, and the route also for one of those rare resources that came to be in high demand for rituals in the early cities. We refer to frankincense, which may have reached Uruk as early as the late fourth millennium BC. Oman was at the hinge between these circuits. The coastal inhabitants, once able to master the winds, waves and ocean currents, could start channelling into the main system the most rare and exotic commodities, and many more mundane ones too. This may be how a pendant made of copal, a resin from the highlands of Tanzania, had already reached the Mesopotamian city of Eshnunna on the Diyala River, east of Baghdad, around the middle of the third millennium BC. When it was first analysed more than 50 years ago, the pendant could not be interpreted, as almost no scientist then would dare to entertain the idea of such long distance relations. The origins of frankincense exploita-

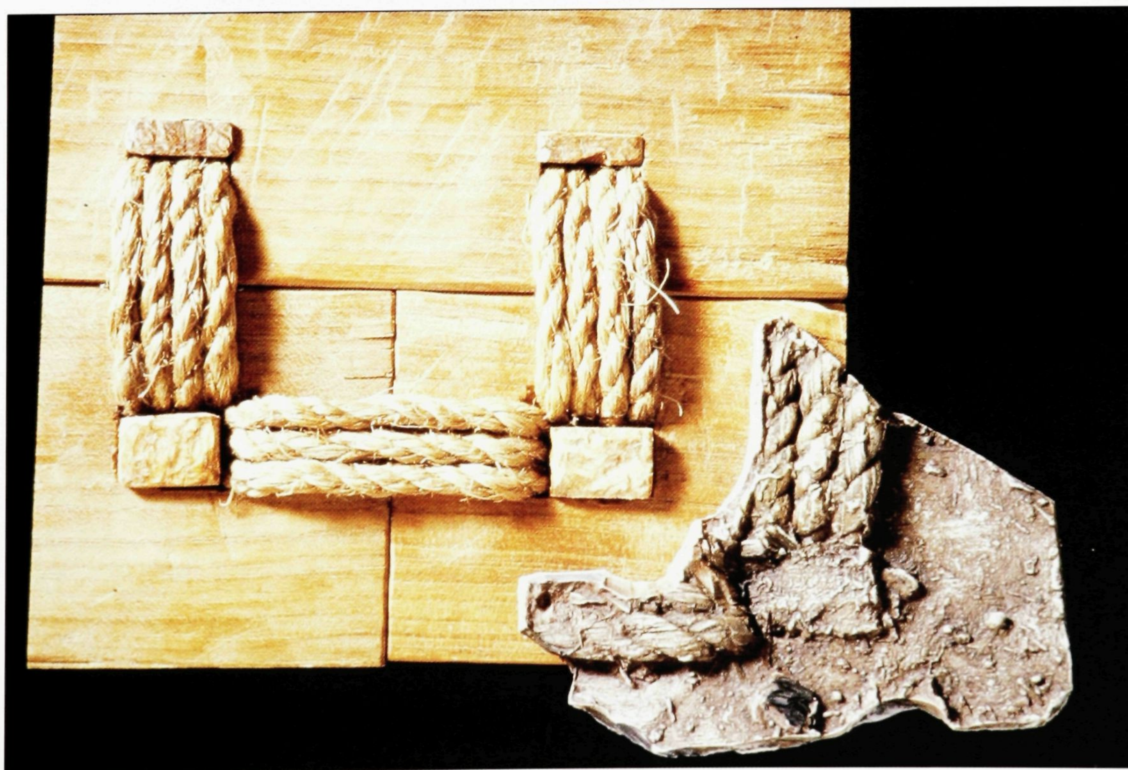


Figure 201: The cast of a piece of bitumen found in building VII, room 6, ca. 2200 BC. It represents the coating of a sewn wooden boat, a feature rebuilt in this picture (photo Joint Hadd Project / Tom Vosmer).

tion and trade are also a matter of controversy. Frankincense was already among the items brought back from the land of Punt by a maritime expedition launched by Queen Hatchepsut of Egypt during the XVIIIth dynasty (ca 1478-1458 BC), vividly depicted in the bas-reliefs of her temple at Deir el-Bahari near Thebes. But it was long thought that its trade really began with the rise of the South Arabian kingdoms of Yemen around 1000 BC, whose wealth was supposed to be largely linked to it. Various Sumerian terms in the early cuneiform texts of Uruk (late fourth millennium BC) bear the general meaning of "incense/odoriferous, aromatic essence" and are related to materials used in ritual, but it is only towards the end of the 3rd millennium BC that a word clearly meaning frankincense is found in the texts. The discovery of an almost contemporaneous stone frankincense burner at Ra's Al-Jinz RJ-2, dating from around 2200 BC (fig. 251), provides our first direct evidence for this trade. What was burnt was already a mixture of frankincense, similar to that widely used nowadays in Oman. Such mixtures include a variety of more or less rare items, like, for instance, the opercula of *Fasciolaria trapezium* conch shells, and one may be sure that these also would have been an additional source of income, travelling in small quantities on the boats. This special topic in reference Oman's past will be treated separately in chapter 11.

People and goods moved over great distances before we have serious evidence that, around 3500 BC, pack animals came into common use. By contrast, boats were certainly already used everywhere. Rivers were the natural alleyways of long distance transport and connected with coastal seaways to form the major corridors for trade between the extreme points of the ancient Orient. Mediterranean islands like Cyprus began to be settled during the late ninth millennium BC, and we have already seen the importance of navigation in the Gulf during the sixth millennium BC, as witnessed by the diffusion of the Ubaid painted pottery manufactured in Mesopotamia.

Little is known about early boats in the Middle East, and for a long time we merely knew with some certainty that they existed. Cuneiform texts constantly mention boats, some of them displacing up to 60 tons, that navigated the waters of Mesopotamian rivers and the Gulf, but the sketchy drawings on seals and a few other objects were poor indicators. The texts, however, cite a particular type of craft, the Magan-boat, made in the shipyards of southern Mesopotamia. We can take it for granted that this type of boat was not built by the Sumerians especially for sailing to Magan but in imitation of those originating from Magan. A long text provides us with a list of items brought during the 21st century BC to the shipyards of the southern city of Gir-su, modern Telloh.

It reads as follows:
178 large palm trees
1400 large pine trees
36 large tamarisk
32 large sedu trees
10 tamarisk of 3 cubits
8.28 tons of palm fibre ropes
1.02 ton of palm fibre strings
1.250 ton of reeds
810 kg of alfalfa
600 [or more] ox hides
1.344 ton of goat's hair
595 litres of fish oil
4260 bundles *of sid* reeds
12,384 bundles of reeds
951 cubic meters of asphalt
for the coating of Magan-type boat

There is no doubt that the text emphasises the importance of reeds and bitumen in the construction of boats, and in particular that of Magan-type boats. Reed-made boats are also known from a few large models deposited in the Royal Graves at Ur a few centuries earlier (fig. 196). However, the only remains of actual boats have been found in Oman. Excavations of the southern compound of buildings at Ra's Al-Jinz have uncovered in each household a store of bitumen fragments, over three hundred in total (fig. 197). They include various sizes and shapes, and the most common are flat slabs two to three centimetres thick. One side is smoothed by hand or a piece of wood while the other bears the impression of woven reed-mats (fig. 198) and of

tightly lashed reed bundles fig. 199). The reed bundles were laced together by twisted ropes made from palm fibre or grass and also appear at regular intervals in groups of two or three on the mats, probably binding them to the structure of the hull. The smoothed outer faces never bear such impressions but have been colonised by barnacles (fig. 200). These never occur on the face impressed by the mats and reeds. Barnacles are crustaceans that colonise boat hulls, particularly in tropical waters, and we may fairly confidently assume that the bitumen pieces found at RJ-2 were remnants of the caulking of reed-made sea-going boats. Barnacles growing on the hull significantly slow navigation and even in modern boats have to be scraped off at regular intervals. In ancient times this work had to be carried out almost every time the boat was dry-docked on a beach. The bitumen caulking had to be scraped away and re-melted in order to make the amalgam for a new caulking. Bitumen being a highly valuable commodity for the R'as Al-Jinz fishermen, any piece that could be gleaned from the process was saved for further use.

This discovery does not come in a vacuum. Others, although in much smaller numbers, are known from the third millennium BC on sites such as Qala'at Al-Bahrain and Umm an-Nar, and bear reed and mat impressions. Fragments of bitumen used for the caulking of sea-going reed boats have already been found for earlier periods at the mid-fifth millennium site of Ayn as-Sayh in the eastern province of Saudi Arabia or at as-Sabiyah H3 in Kuwait. These suggest that we are dealing here with a technology possessing a long ancestry across the Gulf and in the Arabian Sea. If we compare the situation in the Gulf and in north-western Europe, we may even suggest that the Gulf, like the English Channel, the Baltic and the North Sea, acted as a backwater where early maritime navigation techniques could have been developed during the lower sea levels of the early and middle Holocene. We have shown in chapter 4 how maritime trade was already active in the Gulf during the 6th millennium BC. We may assume, from what is known at Ra's Al-Hamra in the 4th millennium BC, that bitumen-coated reed boats were already used in Oman by coastal fishing communities along the Arabian Sea coast, carrying goods and people (fig. 203). Of these early boats we know nothing. However, given their number and variety, the Ra's Al-Jinz impressions, combined with available archaeological, textual and ethnographical data, allow us, for the first time, to propose a reasonably hypothetical reconstruction of the actual boats (window 7.4). By sailing over the waves of the Arabian Sea, their intrepid crews connected the Near East with India and the Central Asian trade outlets, on the one hand, and Southern Arabia and Eastern Africa, on the other.

Excavations in Building VII from period III at Ra's Al-Jinz yielded bitumen pieces that can be associated with a different type of boat. Here, 55 pieces were found stored in a pit in a corner of room 6. Ropes still appear but reed bundles and mats are replaced by imprints of wooden planks. In one case, two groups of three ropes meet perpendicularly to enter into the wooden material through a square hole that was later closed by hammering a small piece of wood into it (fig. 201). This is a clear indication that the technique of sewn plank boats, the traditional Arab watercraft technology, was also already in use during the late third millennium BC. A comparable piece, bearing plank impressions, was found at late third millennium SWY-3 in the Ja'alan. Wooden boats were known in Egypt several centuries before the testimony of Ra's Al-Jinz, both as representations and as actual vessels - witness the magnificent funerary boat of Pharaoh Khufu, dismantled and



Figure 202:
Representation of a boat on a prismatic Indus valley stampseal found at Mohenjo Daro. Note the silhouetted figure operating steering oars at the stern and the possible cabin and masts. According to many authors it represents a typical reed boat while others consider it as a typical wooden plank vessel (photo Maurizio Tosi).

buried in a special building near his pyramid. It was built of luxury cedar wood from Lebanon using sophisticated techniques, including sewn planks. But the fact that wooden boats had landed at Ra's Al-Jinz by the end of the 3rd millennium BC, whether they were locally made or came from elsewhere around the Arabian Sea rim, can only be explained if this wood originated from the Deccan or the Malabar coast of India, the traditional sources of naval carpentry in the western Indian Ocean. The exchange networks that made possible such bulky supplies must have been fully in operation already in the Early Bronze Age. As a matter of fact, the Mesopotamian cuneiform sources repeatedly quote timber as one of the imports from the countries along the "Lower Sea". Some of it is named by the term also used for cedar and one may suppose that this was given in appreciation of the rot-proof quality of the teak from south-western India. By the last centuries of the third millennium BC this may have progressively replaced the ancestral technology of reed boats inherited from the late prehistoric fishing communities of the Gulf.

Much work is still required on the many aspects of boat building, material catchment, cargo loading and maritime routes to give a full account of this outstanding accomplishment of the early Arabians. For archaeologists and historians this is a real challenge and a fascinating agenda for research to come. ❑



Figure 203 – A comb of elephant ivory found in room 1 of Building I at Ra's Al-Jinz. It was the indisputable evidence for the flow of industrial goods that originated from the Indus valley. (ca. 2400 BC).

Window 7.1

Copper from Magan for Mesopotamian Cities

By Gerd Weisgerber

Since the 1980s Oman has been exporting tons of valuable pure copper to the world market. Modern mines have been opened at Lasail and Arja in Wadi Al- Jizzi, to the west of the old town of Sohar, and a copper smelter has been constructed nearby. A new power station is producing electricity for both plant and town. The manpower carrying out the mining and smelting work is based in a new modern town named "Magan". It is this name which hints at the 5000 year history of copper production in the Sultanate of Oman. Around 3000 BC, the country became a major copper provider for metal-consuming civilizations abroad. Oman became a turntable in a network of seafaring trade, with ships coming and going between India, Mesopotamia, and Iran.

Clay tablets written in Sumerian and Akkadian with cuneiform writing between 2500 and 1800 BC report this trade, indicating that several countries at that time, and especially southern Mesopotamia, received a large portion of their copper from a country spelled Magan (in Sumerian) or Makan (in Akkadian). (fig. 204) In addition to merchants, the rulers of the Mesopotamian cities and their powerful consorts organised a surprisingly lively trade. Ships from Dilmun/Bahrain, Magan/Oman, and Meluhha/India at the time of King Sargon, about 2350 BC, docked at the quays of his capital, Akkad, to unload and sell goods from the East and to buy and load goods from many places in a hinterland that might have included northern Mesopotamia, Syria, and the Mediterranean Levant. Fine textiles, ointments, metal objects, and other expensive commodities found their way to the Gulf shores and beyond. Trade was well organised and merchant groups bore the risks for such ventures. Business conditions were set down in cuneiform written on clay tablets. Thus, for example, in the year 2024 BC, the trader Lu Enlil in Ur received 15 garments and two thirds of a talent of wool from the Nanna temple, " ... ware in order to purchase copper from Magan ...". Here, as almost always, the mention of Magan stands in connection with this most important metal for the Mesopotamian states and for the Bronze Age in general.

Mesopotamia is poor in natural resources as far as minerals are concerned. In the flourishing early states of the 3rd millennium BC, a heavy demand



Figure 204 – Copper ingots found at Al-Moyassar. This is the form in which copper was exported overland to the ports of the Gulf and by sea from there to the cities of southern Mesopotamia and Khuzistan.

existed for costly luxury goods as well as for urgently needed raw materials for daily practical, social, and religious use. Large ships with a cargo capacity of at least 20 tons sailed across the "Lower Sea", the Gulf, and the Indian Ocean. Whether these seagoing ships were constructed of reeds, as a reproduction engraved on an Indian seal stone would lead us to believe, remains an open question. Despite Thor Heyerdal's demonstration that the "Tigris" could in fact drift for half a year and sail thousands of kilometres, it remains to be proved that this actually happened. Two seals from Kuwait seem to show a type of ship built of wood. The discoveries at Ra's Al-Jinz undoubtedly indicate that both types of boat were used along the shores of Arabia, but that reed vessels were real boats and not large rafts like Thor Heyerdal's "Tigris".

Aside from exotic animals from India, the vessels also brought lapis lazuli, gold, and possibly tin, channelled along the Indus from sources in the Bactrian highlands and valleys between Afghanistan and Uzbekistan, together with exotic kinds of wood. From Magan came copper and black diorite, the stone of the most prestigious sculptures (fig. 183). Usually the vessels would make a stopover at the trade emporium of Dilmun/Bahrain, a well-known source of freshwater. Dilmun probably kept exclusive control over ship-catering for mariners in the northern Gulf.

On the basis of written sources, we have a good representation of these merchant activities. In the year 2026 BC, during the reign of Ibbisin over the city of Ur (2028-2004 BC), there was hectic activity in the harbour. As a ship was nearly ready to sail, last-minute commodities were delivered, listed, and packed. A scribe noted the whole cargo on a clay tablet. The document was jealously guarded by the merchants Urshulgi, Lugalgaba, and Urshulpae, the latter a widow who risked much of her fortune in this business, expecting an enormous profit when the ship returned. Also agents of the ruler and the temple showed interest. They all trusted Luenlila, the captain, and hoped for profit from the metal that would come from the land at the south-eastern end of the sea – i.e. from the copper of Magan/Oman.

The scribe had written:

"60 talents of gi-wool (1 talent about 30 kg),

10 talents of Halfa-grass,

20 talents of palm fibers from the "Seal-House",

70 bundles of clothes from Urshulgi,

6 Gur of good sesame oil from Lugalgaba,

180 animal skins from Urshulpae,

Luenlila has got from the Temple of Nanna as ware for copper. The jars and boxes with the ware were stowed on the ship for Magan. Responsible Liburbeli in the second year of Ibbisin".

Next day the ship sailed southward, called at the harbour of Dilmun/Bahrain to take on fresh water, and finally reached its destination at Magan on the western shores of the Oman Peninsula, perhaps at the island of Umm An-Nar, just off the coast of present-day Abu Dhabi. Here the inhabitants of a small village had been made wealthy by transit trade. From the north Sumerian merchantmen brought cereals, textiles, cattle, hides, precious metal ornaments, oil in sealed jars, and bitumen in larger vessels.

Bands of porters and caravans of donkeys brought the copper to the island from the smelting centres in the Oman mountains. The Sumerian merchants received the metal in small, bun- shaped ingots not heavier than 1-2 kg. We know they loaded copper cargoes of up to 18 tons, which means 10,000 to 18,000 ingots. This small plano-convex round form was rather convenient for the packing of the caravans and for the porters who had to carry their load in bags on their back. ❑

Window 7.2
From Green to Red: Smelting Red Copper from the Green Ore
By Gerd Weisgerber

At the beginning of the 1970s the Canadian company Prospection Ltd. began to search systematically for copper deposits in Oman after its archaeologically-interested president became aware of the old copper production there. The most modern aerial and ground survey methods were used and local people were questioned to locate old slag heaps. Slag is the black stone-like waste, a worthless by-product, which flows from the furnace after ore smelting. Wherever smelting took place, slag is the best permanent indicator to the archaeologist. Since in ancient times smelting often took place beside or near ore deposits, finds of glossy black slag, which cannot be overlooked in a barren area, show the way to the ore deposits and old mines for geologist and archaeologist alike.

Along the entire mountain chains of Oman, and on Masirah Island, more than fifty copper ore deposits were revealed either by slag or by the red colour of their gossan, the mineralisations remaining from former cupriferous ores. Oman's ophiolithic mountains bear a lot of copper minerals. Ophiolite is magma that has flowed out on the bottom of the sea where also metallic minerals protrude through the openings of magmatic zones called "black smokers". Therefore all over the world ophiolites are often rich in metal-containing minerals. Through tectonic movements they become lifted from the sea's depths to the surface and are finally pressed up to form mountains. In Oman most of the mineralisations are small but there are also some very big ones. Small green showings indicate veins of the copper ore malachite. During the Bronze Age, between 3000 and 1300 BC, they were exploited and the copper in part exported to the surrounding countries, from Iraq to India.

To dig the cupriferous minerals malachite and azurite, miners used stone hammers but also metal chisels to break the rock. A contemporary pointed copper chisel was found at Al-Moyassar in Wadi Samad. After mining, the minerals were crushed with hammer stones on heavy anvil stones where



Figure 205: An artist's reconstruction of Early Bronze Age smelting, after data recovered at Al-Moyassar (German Mining Museum at Bochum).

small circular depressions were formed by pounding. Both of these stones can often be found. To produce metal from the ores these had to be reduced by charcoal with heat above 1100° C. This smelting happened in small pear-shaped and knee-high furnaces built of clay. They had holes for ventilation, probably secured by bellows made of goat skins, otherwise high temperatures could not be reached.

The spatial organization of smelting activities was not uniform (a quite rare situation in archaeometallurgy) because mostly the choice of site depended on the availability of fuel. At many places in Oman, the slag is situated immediately near the mines, at others it occurs near the next wadi with a well and enough vegetation; and finally big ore bodies in those days were accompanied by real miner and smelter settlements. Here remains of innumerable ash and fireplaces are to be found, fragments of furnaces, and of crucibles. They show that the copper drops and brills produced in the early days were embedded in and under the slag and had to be re-melted in a crucible. Finally, the fluid metal had to be poured into a hole in the ground where, after cooling, the ingots took on their typical bun-shaped form. Holes beside fireplaces and an ingot hoard were uncovered at the 4000-year old site of Al-Moyassar-1.

Most of the shapes of these early mines were destroyed by later miners when the same mineral deposits were exploited again and again. But at Jebel Saleli, at Huqain, at Tawi Ubaylah, near Nizwa, and in Wadi Miadin, the ancient mines have survived and are still partly open. Miners followed the green ore veins to a great depth and were only stopped by ground water. Cavities were extremely narrow and no wider than needed. The best example is the mine called Nujum near Bidbid. Here stone mining hammers lay scattered around. At big sites such as Al-Mullaq, Al Lushal, Bilad Al Ma'aidin, Lasail, Arja, Semdah, Raki, and Tawi Raki, after 3rd and 2nd millennium BC exploitation enough copper ores remained in the depths for medieval mining to flourish, and nowadays these sites can play a role in the modern production of electrolytic copper for the world market. ❑



Figure 206 – Mining tools from a mine at Nujum. These were used with almost no change from the Early Bronze Age to the dawn of history (German Mining Museum at Bochum).

Window 7.3
Indian pottery in Oman
By Sophie Méry.

Contacts with the Indus civilization are confirmed by a wide range of objects from the second part of the 3rd millennium BC, including ivory combs, metal objects, seals, beads, and weights. However, the most abundant item by far is pottery, with the black slipped jars (fig. 207) providing the broadest picture as they represent the most frequent type of Indus pottery recovered in the United Arab Emirates and in the Sultanate of Oman, both at coastal sites and in the interior. Black slipped jars are found at all settlements dating to the second part of the 3rd millennium BC. They were transported to Oman from about 2500 BC, during the mature phase of the Indus civilization. More precise dating based on a typology of black slipped jar rims is not yet available.

Most of the sites where these jars occur are not located along the coast but inland, sometimes quite far from major communication routes, and in some cases in very isolated areas. We surmise that they might initially have been delivered to a few specific places, from which they were then redistributed to other sites as part of a local trade network. Archaeological finds made in the Ja'alan region provide a good example of such a distribution of both jars and contents. The proportion of such jars in the pottery assemblage is actually much higher at Ra's Al-Hadd HD-1 than at Ra's Al-Jinz RJ-2, although the latter is only 10 km away. This is probably due to the fact that Ra's Al-Hadd was, in contrast to Ra's Al-Jinz, a natural harbour and favourable anchorage. The coastal site of Khor Bani Bu Ali SWY-3, located some 50 km to the south, was part of the same regional exchange network, but the very small amount of black slipped jar fragments found at that settlement seems to confirm the hypothesis that trade with the Indian subcontinent was largely oriented towards Ra's Al-Hadd. This of course does not contradict the possibility that the jars' contents may have been transferred into different containers, whether pottery or otherwise, and reached Khor Bani Bu Ali in this way. Similarly, after their contents were emptied, the jars may have been put to an alternative use.

What is the exact provenance of these jars? Two potential areas for their production were suggested by archaeometical studies along the Ravi river (Harappa) and the Indus river (Mohenjo-Daro).



Figure 207 - National Museum, New Delhi: an onion-shaped jar from Harappa, a most common large transport vessel in the Indus Civilization, of the same type as the inscribed one found at RJ-2. They made very resistant, waterproof containers, designed to fit the sharp curvilinear profile of the hull of boats, as were Roman amphorae (courtesy of the National Museum, New Delhi).

Differentiation among samples from both sites was possible because alluvial deposits differ in these contrasting contexts, and this is reflected in the composition of the fabric (fig. 207). None of the analysed black slipped jars from the Gulf region came from the Ravi river production zone but from the Indus river area, as was also the case with the jars we analysed from Nausharo and Miri Qalat in Baluchistan and Makran.

The jars and their contents were first intended for the internal Indus market, and we are probably far from understanding the complexity of their production system within the Indus world. The chemical composition of some jar samples suggests that there were probably more production zones within the Indus world than the two areas we were able to define (fig. 208), but these have yet to be geographically determined. The production of black slipped jars was linked both to the Harappan domestic market and to the external market, i.e. the Gulf, including Bahrain. The vessels were certainly made to order, regarding their aspect and volume, to meet the requirements of transport and trade of their contents. While they are difficult to handle, their shape renders stacking and shipment by river or sea relatively easy; and they were possibly protected during transport, perhaps with straw or mats, because their thin walls and bases are quite fragile.

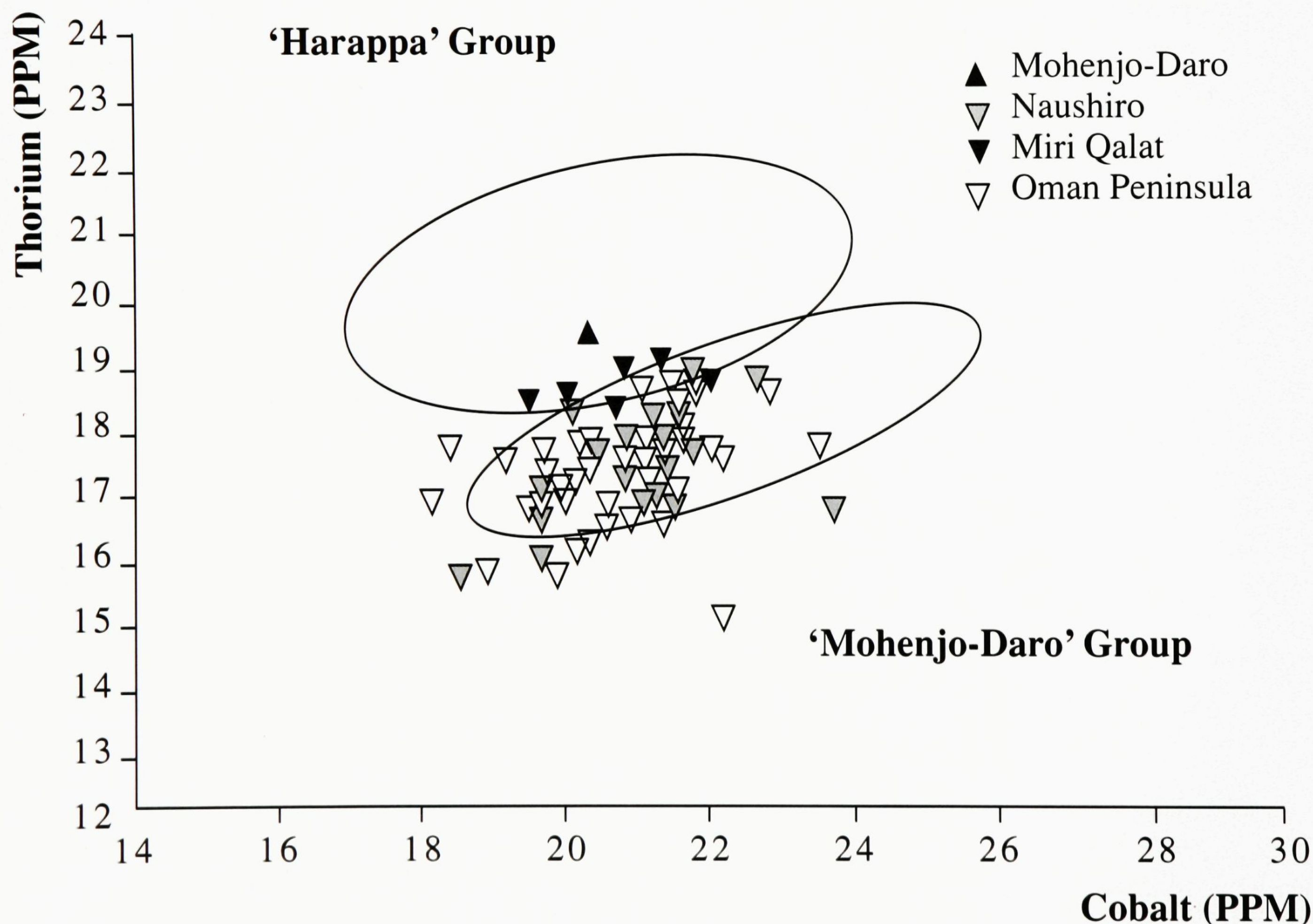


Figure 208:
Chemical analysis of Indus pottery has shown that most of the Indus vessels came from Mohenjo-Daro or the Indus Valley potters' workshops, but not from Harappa and the Ravi valley (diagram by Sophie Méry and Jim Blackman).

The fact that black slipped jars were produced in a specific region, the Indus basin, and were clearly intended for long distance trade, indicates that they were designed for the transportation of specific goods. Pickled vegetables or fruit, clarified butter, wine, honey, or even indigo - a tentative list of such Indus products which could have been transported has been proposed by J.M. Kenoyer, which contrasts P. Gouin's suggestion of a specialised trade in dairy produce. However, results from laboratory tests of organic remains have so far proved disappointing. These vessels are characterised by a dense paste and a waterproof slip, making them less than ideal for this type of analysis.

In the Oman Peninsula, there are other assemblages of classical Indus pottery types which are also strictly associated with settlements. Pedestalled dishes and perforated vessels are the most common (fig. 193), but few other types are found. Many, although representative of only a small part of the diversity of the Indus assemblage, were found in the Ra's Al-Jinz/Ra's Al-Hadd area, especially at the site of HD-1. On the Gulf coast, the diversity of Indus pottery types is also apparent at Umm An-Nar. But in the interior of the peninsula, generally only one or two types are identified along with the black slipped jars. These are usually the perforated vessels and pedestalled dishes. Pedestalled dishes were also found at Hili 8, Bat and Al-Moyassar-1. Some had been imported from the Indus valley (but not from the Ravi production zone), but others were local copies, as demonstrated by laboratory analysis.

A few other Indus types are almost exclusively associated with funerary contexts of the last centuries of the 3rd millennium BC. These include small painted bottles and various miniature pots, which are the best-represented Indus pottery types in the Oman Peninsula after the black slipped jars. Bottles (fig. 182) were first identified as possible imports because of their characteristic decoration, and laboratory analysis confirms this impression, despite the fact that macroscopically the ware is non-micaceous. Chemically, the Indus bottles discovered in the Umm An-Nar graves fall into the Mohenjo-Daro composition group (fig. 208), thus confirming a pattern of exchange mainly oriented towards the southern part of the Indus basin. An important series of complete pots were found at Hili North Tomb A and in the funerary pit-grave of Hili N. Due to their frequent presence in Oman, and to the absence of similar pottery shapes in Pakistan and India, we surmise that they were principally intended for export. As such, they would not be unique among Indus world products, as evidenced, for instance, by some types of carnelian beads. Today, research is not so much concerned with recognizing imported products as with better defining the manner of diffusion of certain techniques, particularly in the region covering Makran, Baluchistan, and the Indus valley.

Thus, comparison with material from the Indus valley is particularly interesting. A time-lag in mastering the shaping or throwing of pottery on the wheel is obvious at the end of the 3rd millennium between the potters of the Indus and those of the Oman Peninsula. Certain pieces from the Indus valley which were found in the Umm An-Nar tombs of the end of the period are evidence of a particularly accomplished mastery and even technical virtuosity. ❑

Window 7.4
Reconstructing an Early Bronze Age Boat
By Tom Vosmer

The impressed bitumen slabs discovered at Ra's Al-Jinz provide for the first time a window into the construction of sea-going vessels from the Early Bronze Age along the coasts of the Arabian Sea. Preserving impressions of bundled reeds, woven mats and lashed planks, the bitumen slabs provide important clues to the processing and assembly of boat-building materials, and information on the methods that may have been used to assemble them. From them we are able to identify the type of reeds used, note the sizes and materials of the ropes used for lashings, determine the spacing of these lashings, analyse the composition of the bitumen amalgam and identify its source, and make informed hypotheses about the sizes and configuration of reed bundles and wooden planks.

The largest body of evidence about the shape of Early Bronze Age boats in the Gulf and beyond originates from Mesopotamia, where some four hundred representations dated before 2000 BC are found. A few models in clay or bitumen mainly found as grave goods, but by far the most numerous representations are found on seals and sealings. Other drawings are found engraved on the Dilmun stamp-seals found in the Gulf and on a few seals and sealings of the Indus valley. Some leads may also be gained from the study of contemporary watercrafts or tomb models from Egypt, which shared a similar techno-



Figure 209 – Test of a 5 m long model on the lagoon at Ra's Al-Hadd, February 2002. The sail was made of sewn mats. The experiment was very successful (photo Joint Hadd Project).



Figure 210: His Highness Sayyed Haytham bin Tariq Al-Said and Tom Vosmer inspect the second experimental boat built at Ravenna in July 2003 (photo Joint Hadd Project).

logical base. All these representations display a large variety of forms and proportions, reflecting the different purposes of the watercrafts, or of the models themselves. Some might be associated with deities or rituals and therefore perhaps not display the most efficient hydrodynamic form. Some are river boats and others sea-going vessels. Most of them however display common characteristics: they are double ended, have high curving ends, and many exhibit "Tumblehome". Tumblehome is the transverse curving in the sides of a vessel, believed to be a desirable structural feature of reed boats, aimed at lending stiffness to the hull shape. Some models have marks indicating that they had once thwarts or beams across the gunwales, also beneficial in stiffening the structure as well as providing anchoring points for rigging. These examples provide a marvellous basis to study the technical aspects of Early Bronze Age seafaring and ships, with the aim of reconstructing a hypothetical reed-built vessel.

It is assumed that our sea-going vessel is actually a boat, not a raft as the "Tigris" built by the Norwegian navigator Thor Heyerdahl, who sailed with it in 1978 from Basrah to Muscat, Karachi and Aden. It is a waterproof hull, not a buoyant platform, floating by displacement of water, not through the natural buoyancy of its materials. The boat form provides some advantages for cargo space and protection of the cargo and crew from the elements. It is much more hydrodynamically functional than a raft, but also requires more sophisticated engineering. Considering the data at hand, there is however little doubt that such an engineering was already available during the Early Bronze Age.

We must also assume that the designs had already evolved over millennia for coastal and ocean sailing and were reasonably suited to perform their function, strong enough to withstand environmental conditions, manoeuvrable, adequately safe and seaworthy. Interpreting the information from the diverse archaeological sources within the parameters of sound naval architectural principles therefore provides a path towards developing the hypothetical reconstruction of a bundled-reed vessel.

The basic shape is dictated by four factors: the materials from which the vessel is built, the environment in which it operates, the purposes for which it is used and the method of propulsion. The natural



Figure 211 – Model 3 under construction in the boatyard at Sur, spring 2005. Notice the lashed bundles and leather gunwale (photo Tom Vosmer).

form assumed for a reed boat as it is being assembled is a sickle-shape profile, or crescent moon shape. Within the general crescent paradigm, there is a range of variation. Sometimes the ends recurve inwards, sometimes stand upright, occasionally they are formed in S-shaped. In section, the reed boats probably resembled their modern descendants. They had no keel, were round-bottomed, almost flat amidships. lacking any lateral surface except for steering oars to provide resistance to slipping to leeward, they were probably not proficient reaching boats and would have little if any windward ability. There is, however, speculation that reed boats may have used breeze without taking water over the gunwale. The bundled reed hull would be reinforced with wooden frames and thwarts. A woven mat covering would be sewn on the outside of the hull and the entire vessel coated inside and out with a bitumen amalgam. The vessel would be propelled by a single sail of rectangular shape supported by a bipod mast. Steering could be done with two quarter rudders.

To gain experience with the types of materials and the possible methodologies before construction of a full size vessel, a number of small scale models have been built and discussed, and a small prototype with actual material iwas tested (Figure 209). Combining practical experience with ethnographic data and examination of the imprints on the bitumen slabs of Ra's Al-Jinz, various ways of making individual bundles and assemble them into a hull form are currently explored, using Phragmites reeds cut from small reed belts in the area of Sur. According to the imprints, the reed bundles used in the construction have a maximum diameter of 30 cm, tapering to less than 5 cm near the ends. For a 13 metre long vessel, the smallest size reasonably envisaged for sailing across the Arabian Sea, each bundle is calculated to weight approximately 135 kg, and there would be perhaps 23 to 25 bundles in a typical boat (Figure 210). Therefore the total weight of reeds used would between 2100 and 3400 kg.

The bundles are analogous to planks in a modern boat. just as the shape of individual planks has a great deal of influence on the ultimate shape of a boat, so the form of the bundles influences the shape of the reed boat. The taper has to be carefully man-

aged to produce and maintain a proper developing hull form as the vessel is built. This skill is not intuitive, it comes only with experience. The builder must have a clear concept of the final stage of the vessel, and be able to imagine the effect of each individual bundle as it is added. Only builders with immense experience could fabricate all or most of the bundles prior to assemble them. Hence, the workforce was probably divided into people who made the bundles, under the supervision of a master builder, and people who assembled bundles. Bundles were thus made and fitted in their turn, with modifications done to the individual bundles as needed before they were fixed to the hull.

Several of the bitumen fragments recorded the impressions of larger structural elements within the bundles, usually about 2 or 3 cm in diameter. Those are thought to be either large reeds, wood (perhaps willow) or the mid-rib of date palm leaves. They could have served several purposes but it is very probable that they were stringers added to improve the longitudinal strength of the bundles. they may have been structural "intersticial" pieces positioned between two bundles, with the bundle on either side lashed to them. They could also have served as anchors for the woven mat cover.

Lashing proceeds from the centre of the vessel towards each end as bundles are added on either side in pairs. The system is complex as a great number of ropes are used at the same time, but has two important advantages. Firstly any failure of a rope lashing, a very common event, remains localised. Secondly, transverse framing, possibly also made of reed bundles, can be fitted simultaneously as building progresses, thus eliminating the difficulties of passing lashings for frames between tightly lashed bundles after completion of the bundled hull structure (Figure 211).

Transverse beams extending a short distance beyond the outside of the hull would have been lashed to the gunwales. These provided additional



Figure 212:- Ali Al Kindy, of Bahla, weaving the goat hair sail of model 3 (photo Alessandro Guidoni).

hull strength and points at which to attach rigging, mooring tackle, oars and steering oars. At least one beam would have been used to support the bipod mast. The mast could have been stepped in a pair of wooden timbers lashed to the frames or to the gunwales. A single rectangular sail was hoisted on a yard (Figure . The Indian Ocean iconography suggests that the sails were tall rather than wide, although Egyptian sails were the opposite. The tall sail provides the potential to catch more wind, and is recognised as a more efficient one, but a lower sail of the same surface provides more stability.

Most of the outside of the hull was covered with woven reed mats. They were sewn to the bundles with light cord that the bitumen evidence suggests followed an hexagonal pattern, repeated across the surface of the mats. The whole of the mats as well as the interior of the vessel was coated with a bitumen amalgam comprising bitumen, about 2.5% fish-oil, about 50% calcium carbonate, chopped reed and probably animal hair. The formula for this amalgam was determined by chemical analysis of RJ-2 bitumen and through a complex series of practical experiments done by Prof. Gilberto Rinaldi at the University of Rome. These experiments tested various combinations and proportions of components to arrive at the best composite to fulfil the requirements.

There are actually critical demands put on the bitumen based coating, which the bitumen alone could not fulfil. Firstly, when immersed in water the amalgam must adhere to the structure to which it is applied, whether that is wood, reed or leather. Secondly, the coating must be waterproof. Over a wide range of temperature it must have dimensional stability, must not run or sag, nor become brittle and crack. It must have resistance to damage from impact. The mechanical properties of pure bitumen are not satisfactory for these functions. Subjected to the force of gravity, bitumen is plastic, it flows or "creeps". On the contrary under impact, it fractures in a brittle manner. No less important, the coating must be as light as possible. To resolve these demands the aforementioned fillers were added: finely ground calcium carbonates (probably from crushed seashells, burnt coral or coral sand) and "anti-stripping" agents (the fish-oil). The required properties were further enhanced by the addition of organic matter: chopped reeds as noted above, other plant fibres, and animal hair. These made the amalgam lighter, and also improved dimensional stability. The calcium carbonate made the amalgam more dimensionally stable, while the "anti stripping" agent helped the bitumen to adhere to the substrate. At the present stage of the project, many problems remain to be solved concerning notably the coating process of the hull, the way the amalgam was prepared and heated, etc.

A boat of this size could have been crewed by six to eight men. The vessel itself, including the weight of reeds, ligatures, framing, bitumen, sail, mast, rigging, provision and crew would displace about 8 tonnes, leaving about 4-7 tonnes for cargo. This is much less than the cargoes up to 12 tons mentioned in some cuneiform texts, suggesting that larger vessels were operated, but the size of our proposed reconstruction was determined to restrict the problems linked to strength of materials that ancient builders certainly mastered much more than we do. The crew would include not only merchants, sailors and experienced navigators, but also people who were familiar with the boat building process as well, in the event that maintenance or repairs were necessary enroute. This exigency implies a highly regulated and organised maritime infrastructure and, particularly in the case of small crews, the need for multi-skilling. ❑

Window 7.5
Early Bronze Age navigation and trade routes
By Tom Vosmer

Navigation and trade routes

Navigation and port-finding were skills which depended on the accumulated knowledge of generations of fishermen, sailors and astronomers, as well as the skill of the individual navigator. In some instances of long-distance travel, safe navigation may have demanded the presence of a local knowledgeable person who have been hired enroute. Seafarers merged a large array of techniques to aid them in finding their way. They observed currents, the pattern of winds and clouds, bird life and sea life. The colour of the water could indicate depth, composition of the bottom, the presence of a coastal river. The colour of the sky, particularly near the horizon where the reflection of sunlight off a shore could influence the atmospheric colour, was also a clue. Navigators observed landmarks on the shore, and the patterns on the surface of the water. They sounded the water depth and took samples of the seabed. Even the dangers – reefs and shoals – were guides to position. The stars provided the keys to transoceanic navigation, they largely liberated sailors from the slavishly tracking of the coast. Knowledge of star positions, of risings and settings, of stars paths, allowed the mariners to determine their latitude and to set their course of ports across the sea.

A number of factors influenced the maritime trade routes of the Early Bronze Age (Figure 213). Some, such as the topography, weather patterns, and

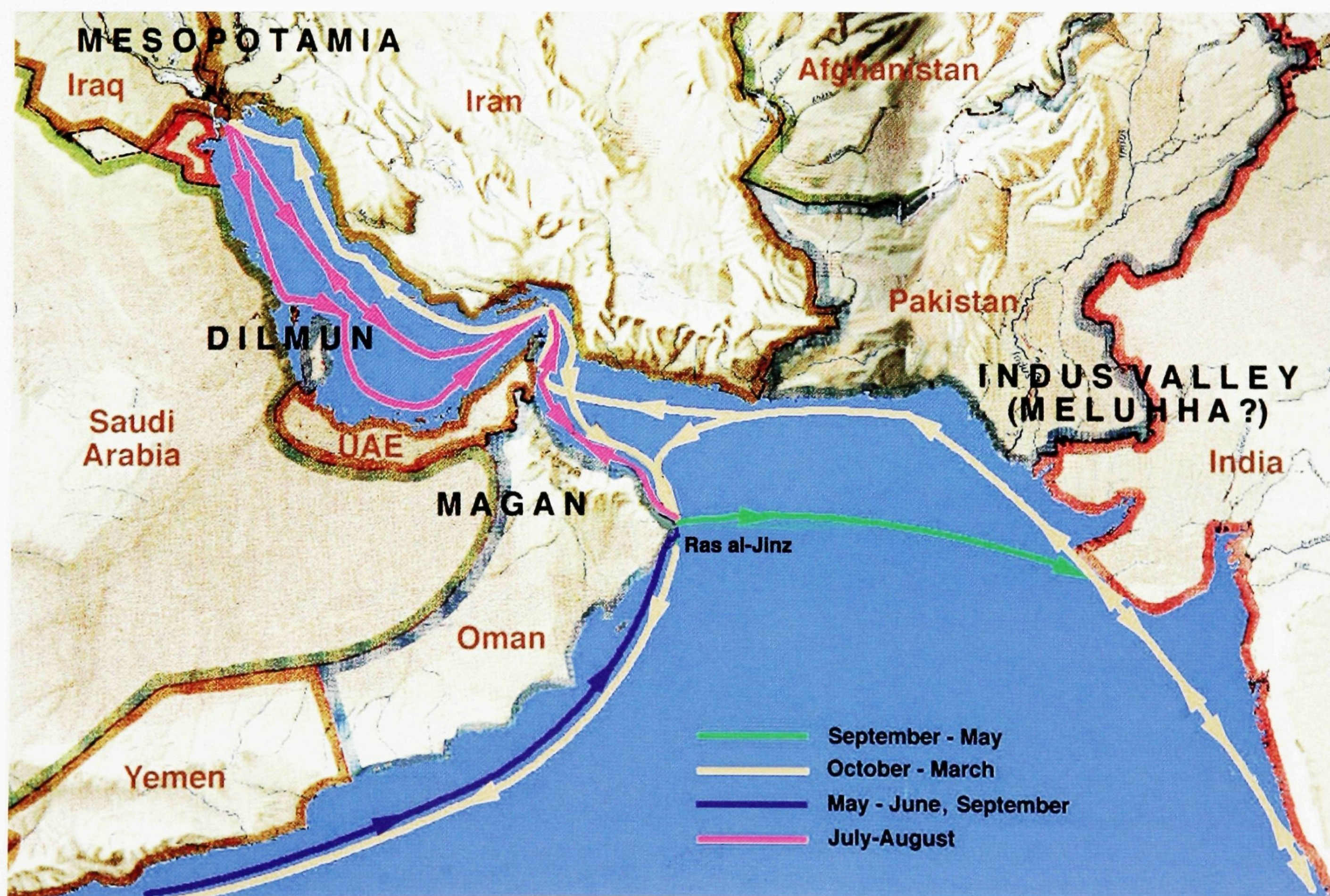


Figure 213: - A tentative map of ocean routes in the mid-3rd millennium BC (Map by Tom Vosmer).

the location of ports were to an extent fixed, while others were variable such as trade goods in demand, the economic and political arrangements among trading partners, the maritime technology of the day, the performance capacities of the watercraft involved in the trade, and the sailing and navigational skills and experience of the crews. To establish ancient sea-trading routes with complete certainty is therefore impossible, but the topography of the coasts, weather patterns, the surmised capabilities of Early Bronze Age sailing craft and the distribution of artefacts would provide some clues.

Many studies have been done concerning sea level change in the Arabian Sea and the Gulf. Major changes took place much earlier than the Bronze Age, but details of the Arabian coast of the Gulf still varied during the third millennium BC and may have obvious ramifications for discovering maritime trade routes. Umm an-Nar for instance was still at that time an island surrounded by shallow lagoons and not as nowadays by a barren sebkha. The head of the Gulf has changed so dramatically that Mesopotamian cities now situated well inland once had sea-going ships mooring at their quays. This does not mean that those cities were actually on the coast however. The extensive Mesopotamian river and canal system enabled ports to be situated far upstream, much as ports are in various parts of the world today.

The most probable sea route followed during the third millennium BC was along the Arabian coast of the Gulf. The occurrence in many sites of archaeological items from Mesopotamia and the Indus, as well as the presence of sheltered anchorages and fresh-water wells supports this view (Figure 214). On the other side, the Persian coast is backed by limestone ranges, and everywhere is barren and unhospitable. The coast is often subject to onshore winds, making navigation hazardous.

Seasons had an enormous effect on the route followed. In the Gulf of Oman the wind is most often northerly, and the currents are variable but often follow a similar pattern. The current along the coast of



Figure 214 – The sand spit and lagoon of Ra's Al-Hadd, a compulsory port of call for ships to wait for favourable winds in Arabian navigation. There was a small and poorly preserved Neolithic site on the flat rocky promontory at the end of the sand spit. A symbolic item of Early Bronze Age Mesopotamia known as an eyestone was found on the surface during the first reconnaissance in 1985. This may be an indication that the promontory was used by mariners as a place of worship to ask for safe travel or to give thanks for returning from highly risky voyages, a common practice in traditional seafaring (photo Joint Hadd Project).



Figure 215: - Model 3 off the coast between Sur and Ra's Al-Hadd for its first and last tentative voyage, September 7 2005.

Oman, especially from Muscat to Ra's Al-Hadd, moves out towards the Indian Ocean. Whereas on the other side of the Gulf of Oman along the Makran coast, the current is usually west moving, especially near the end of the Northeast monsoon. There are some important trading outposts of the Indus valley, such as Sutkagen Dor or Sotka Koh. Consequently, on any return passage from the Indian Ocean into the Gulf, the preferred route, at least in the Gulf of Oman, could be along the Makran coast, unless a south easterly wind was blowing, in which case that coast would be very dangerous. If the Northeast monsoon were blowing, the wind and current would probably be ideal for cruising along the Makran coast. On reaching the vicinity of Jask, a vessel could turn south for Oman, or Northwest for Musandam or beyond.

Winds in the Gulf are predominantly from the North or Northwest. The winds are channelled by the topography and generally follow the coasts, turning south-westerly on the western side of the Musandam peninsula. This is very advantageous for boats sailing out of the Gulf, but poses difficulties for Early Bronze Age boats lacking weatherliness. Any boats sailing from the Gulf of Oman towards the northern Gulf would have to either be very patient, waiting for the less frequent south-easterlies (more prevalent from December through February), or would work the diurnal land and sea breezes.

A lack of weatherliness combined with less than optimum sailing speed of Early Bronze Age seacraft, meant that efficient passage-making depended on skilled observation and detailed knowledge of wind patterns and, not less important, current patterns. Nevertheless, Early Bronze Age boats and sailors were clearly capable of carrying an efficient and vigorous sea-trading (Figure 215). ❑

Chapter 8

Early Arabian Civilisation at its Zenith

Chapter 8
Early Arabian Civilisation at its Zenith

By the middle of the 24th century BC, the *Land of Magan*, the Mesopotamian name for Oman, appears for the first time in a cuneiform text from King Sargon of Akkad, founder of the first Mesopotamian Empire. This in itself should not be given too much significance because, even if they are known by the million, cuneiform texts only represent scraps of what was actually written. Many older mentions may have been destroyed or still wait to be found in the dust of Mesopotamian archaeological sites. We can, however, be confident that Oman, the *Land of Magan*, had long been known in Mesopotamia at the time of this first "historical" reference. With it, however, Oman enters written history at the peak of its Early Bronze Age civilisation, during the second part of the third millennium BC.

Archaeological sites with a developed material culture are known all over Oman, showing the country as a major partner in the international trading system from Mesopotamia and Syria to Iran, the Indus civilisation, southern Arabia, and most probably the Horn of Africa. The wealth of Magan, and in particular its minerals like copper and diorite, attracted ambitious conquerors, among them the powerful king of the Akkadian empire of Mesopotamia, *Manishtushu* (fig. 216) and his son, *Naram Sin*. The first claimed a victory over 32 Magan fortresses that sound like a distant memory of the oases and their towers. On the other side of the Arabian Sea, the powerful Indus civilisation that flourished in Pakistan and India during this whole period, with its fortified trading posts along the Makran coast, was probably attracted by Magan as well. We have no historical record in the undeciphered Indus Valley script to tell us of similar military enterprises, but they cannot be ruled out. The archaeological record, however, leaves no trace of any foreign domination but yields, on the contrary, a picture of a civilisation in its own right. The oases of Magan, with their towers scattered among palm groves, were centres of local and international exchange networks that, through many ports and smaller stations along the Gulf and the Arabian Sea, traded with the whole oriental world. We will now present a little more detail about this early peak of civilisation in Oman.

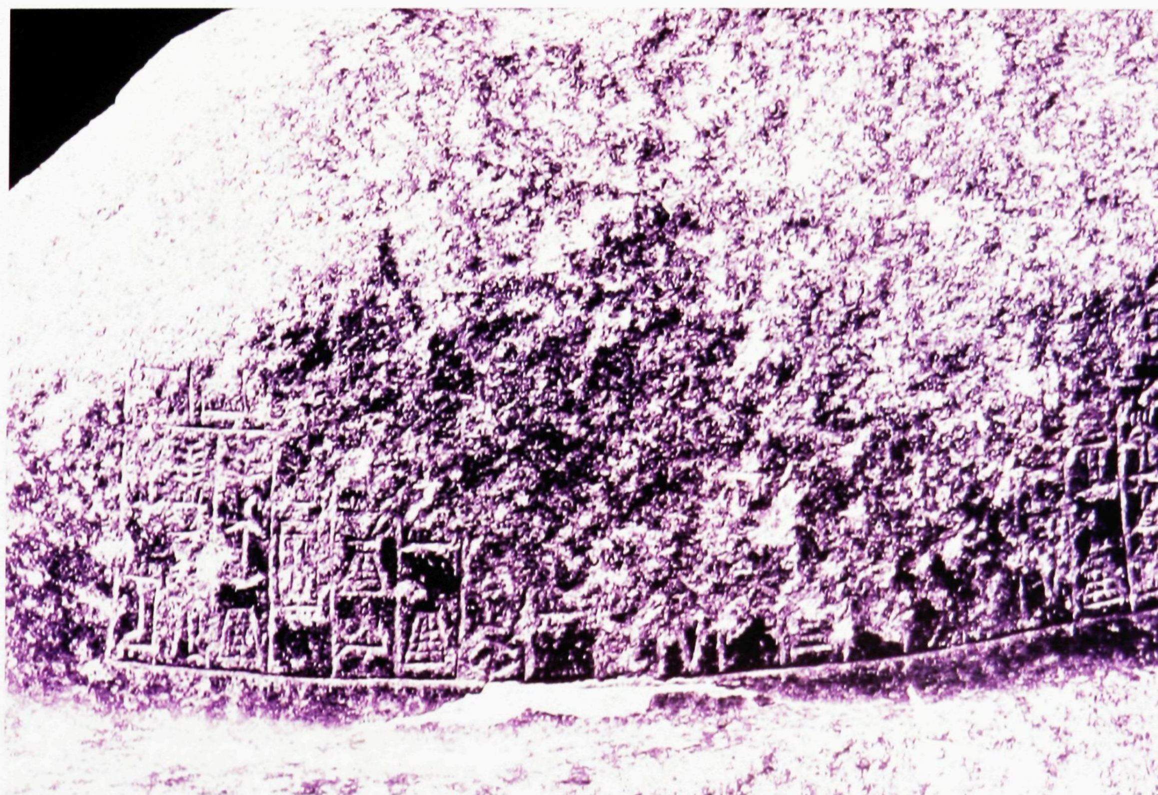


Figure 216: Cuneiform inscription on the base of the statue of Akkadian King *Manishtushu*, recording an expedition to Magan (Musée du Louvre, Paris).



Figure 217: These huge facing stones of a large monument at Al-Kashbah were over 1.5 m each in size and were obviously cut and assembled after a huge collective effort (photo Jürgen Christian Meyer).



Figure 218: The facing of tower 1145 at Bat is also illustrative of the kind of work implied by such monuments (photo Jürgen Christian Meyer).

This period has been coined the "Umm an-Nar culture", from the name of the small coastal island where it was first found in 1958 near the modern town of Abu Dhabi in the United Arab Emirates. A team of Danish archaeologists led by Geoffrey Bibby made the discovery during their first season of scientific excavation in the Oman peninsula. Though such a term may be useful for archaeologists, it can be misleading for a general audience, and even for some archaeologists themselves! If Rome was the starting point and the centre of the Roman civilization, we should not derive from the expression "Umm an-Nar culture" the idea that people from this site, or from the Gulf coast in general, later colonised the interior and were at Oman's political and economic centre at this time. It simply means that everywhere in Oman all archaeological sites dating from the second half of the third millennium BC, and in fact even from two or three centuries earlier, have yielded artefacts that closely

resemble those found for the first time at Umm an-Nar. Nor does this mean that a deep transformation, similar to that described before (see chapter 4), or to that which will be described later (see chapter 9), occurred between the "Umm an-Nar culture" and that of the earliest oases. In fact, most of its characteristic elements were already present by 3000 BC or gradually appeared after that time. Of course there may have been moments when the change was more spectacular, for instance with the adoption around 2750 BC of a new type of burial; and of course many historical and political events took place during the third millennium BC. Some sites increased or lost their importance; some families gained and lost power. But seen from a distance, and with the low resolution lenses of archaeology, we can simply say that the economic and social system that resulted from the transformations of the late fourth millennium BC grew increasingly powerful for almost a millennium. This growth towards more achievements in material culture, together with the history of research in Oman, explains why we have much better information on this period. It may be presented as the zenith of Early Bronze Age civilisation in Oman, but we had better be careful and not diminish the importance of what came before and what happened after. It is just a very visible period of a long history.

Archaeological sites related to the "Umm an-Nar culture" are known all over the country. The major oases that were already settled by 3000 BC, such as Bat, Bisya, Hili and many others, continued and grew in size. Third millennium BC copper mines have been located and an oasis site also involved in copper metallurgy, probably one among many, is known at Al-Moyassar. Settlements are found in those coastal areas where agriculture was also possible or known for the first time. Earlier ones still wait to be recovered. This is the case at Al-Abraq and Ra's Al-Khaimah on the Gulf coast or Bidiya and

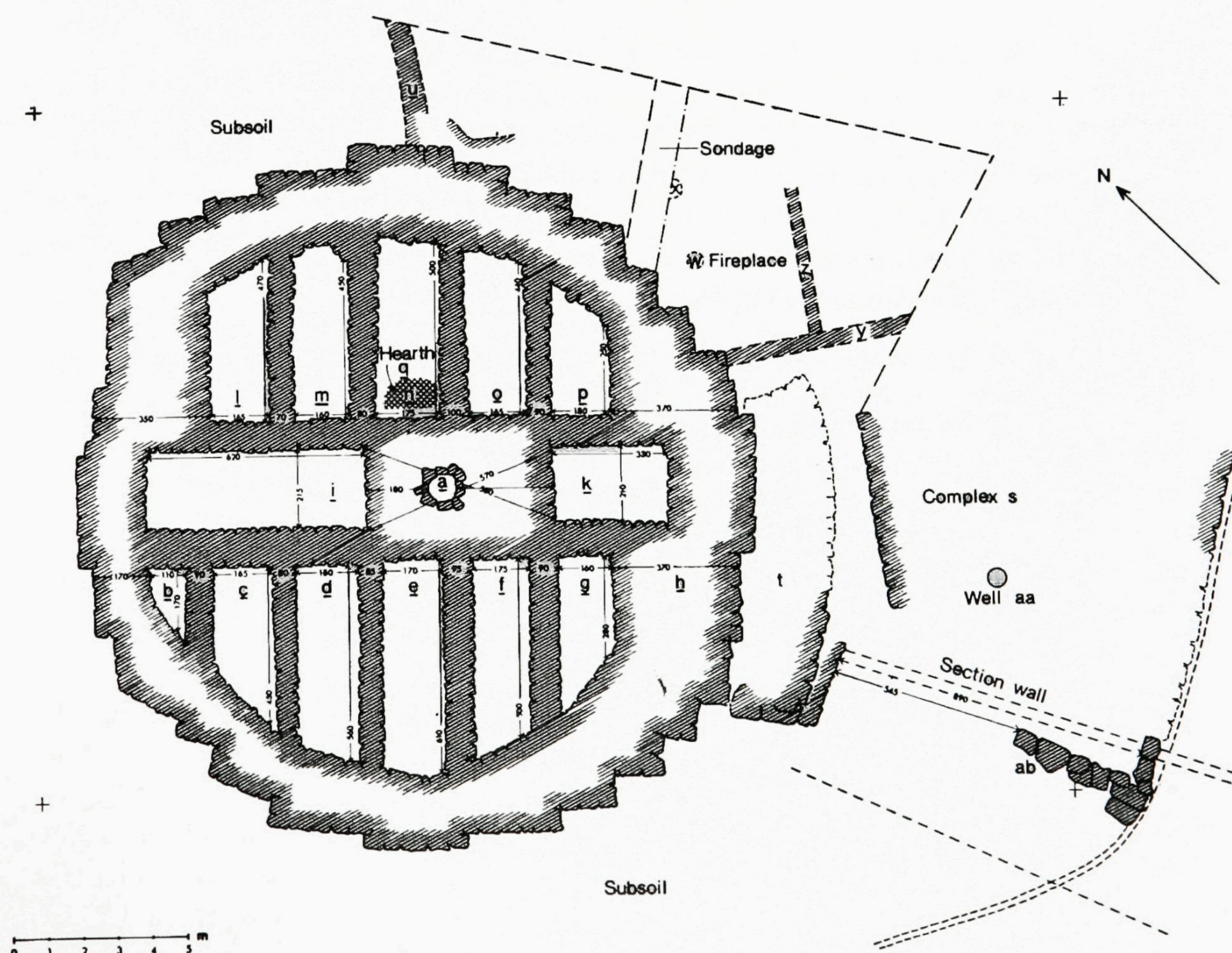
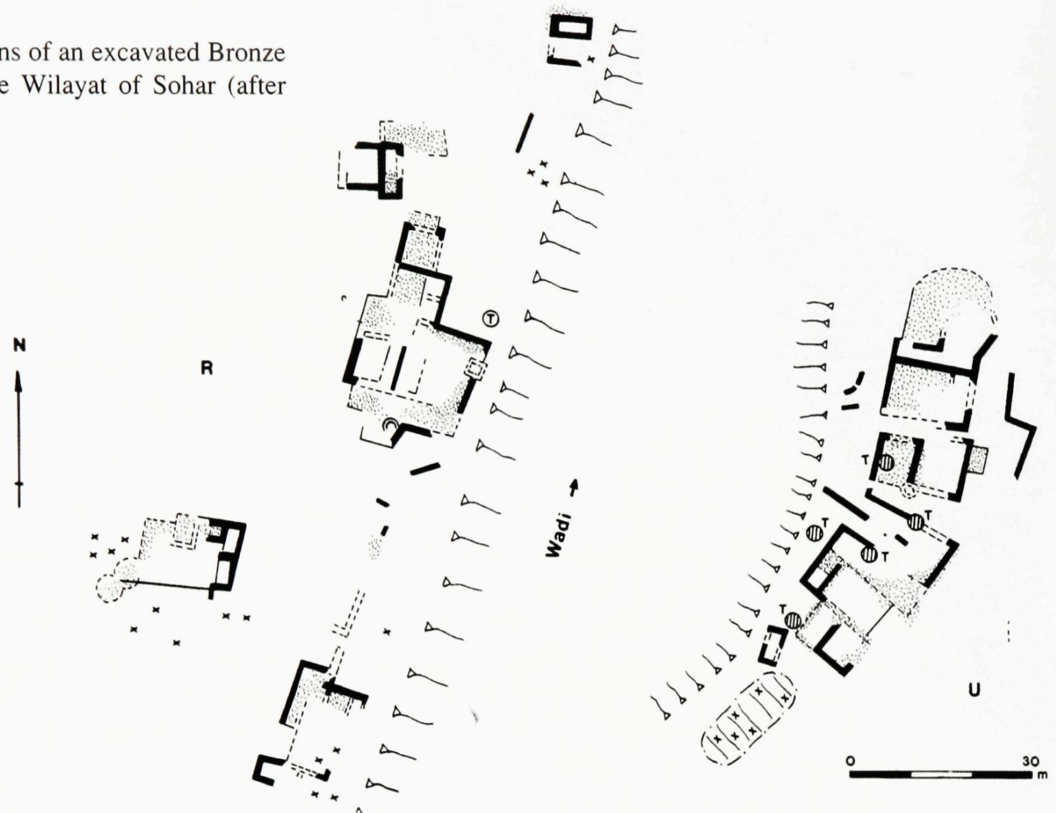


Figure 219 - Plan of tower 1145 at Bat, ca. 2600 BC (after Frifelt, JOS 3).

Figure 220 – Visible remains of an excavated Bronze Age village at Zahra in the Wilayat of Sohar (after JOS 9).



Kalba on the Arabian Sea. Purely coastal sites with no direct agricultural background have been excavated at Umm an-Nar and Ra's Ghanada on the Gulf coast, at Ra's Al-Hadd, Ra's Al-Jinz, and as-Suwayh on the Arabian Sea. This enables us to draw a fairly complete picture of social organisation and lifestyle during the Early Bronze Age civilisation in Oman.

Oases: the Core of Early Bronze Age Oman.

At the centre of the system were the oases. They concentrated heavy investment in resource development and, around them, in a large array of local crafts. Their towers, at one and the same time strongholds and residences for the leading families, are probably the most appropriate symbol of their organisation. Most are round, with diameters ranging between 22 and 35 metres, and they certainly were impressive structures. Quarrying and piecing together their huge stone blocks (fig. 217, 218), moulding and piling up hundred of thousands of mud-bricks, was certainly a large-scale collective task for the communities involved in their construction. Trade networks were probably organised around these centres as far as both local and international exchange are concerned. Being central to the distribution of most resources, they were also the places from where copper exploitation and trade was controlled. Some authors have even suggested applying the term "towns" to these oases, although we feel this may be confusing as many factors differentiate these settlements from the urban centres of nearby Mesopotamia, Iran and the Indus valley. We are unable at present to identify in any of them a place where power would concentrate or the planning of a settlement that can be attributed to a hegemonic organisation. Groups of "common" houses are located near the towers, amidst the palm tree gardens and fields, while the nearby collective multi-chambered graves house the dead and display both the unity and importance of each kin-related group. This does not mean that everything was primitive. Mathematical studies by Marcello Ranieri of the tower plan at Bat or of the "common houses" nearby show that all these constructions, from the towers to the apparently simple houses, was the result of well-mastered architectural planning (fig. 219). According to the evidence gathered at Hili, craft areas could be located everywhere room was available. This could be at the foot of the towers - witness several coppersmith's workshops at Hili 8 (fig. 173);

in between the towers - witness a potter's kiln near towers Hili 1 and Hili 10; or even covering the ruins of earlier destroyed Umm an-Nar type graves, as at Hili M.

"Common houses" are known at several sites. They have been found during prospection at Zahra near the copper mines of Arja (fig. 220), at Amlah near Bat, and at various places in Wadi Andam and Wadi Far. They have been recognised at Bat on a low terrace east of tower 1145, and excavated at Al-Moyassar, Umm an-Nar, and Ra's Al-Jinz. Their walls can be made of stones, as at Umm an-Nar, of mud-bricks on a stone base, as at Bat and Al-Moyassar, or of mud-bricks only, as at Ra's Al-Jinz and Hili. Everywhere, they are rectangular in plan and consist of several rooms. Al-Moyassar, the excavated houses date from between 2200 and 2000 BC. They seem to be organised with one to four rooms on one or two sides of a large rectangular courtyard that was partly devoted to craft activities like copper processing (fig. 229 and 268, see window 8.2.). At Umm an-Nar, most of them clustered together in an unclear plan, with the exception of a larger isolated building that has been interpreted as a warehouse. Those at Ra's Al-Jinz, excavated in full detail, are of great interest as they provide indications of housing organisation. Two groups of houses were excavated, occupied only in the winter season between 2500-2250 BC and 2350-2100 BC, and both exhibiting a rather long history of extensions and refurbishing (fig. 221). According to their site location, in what follows we will refer to these respectively as the southern and northern compound of houses.

In the southern one, three main units were distinguished. Each consisted of three or four large rectangular rooms, some two metres wide and six metres long, to which in one case two smaller storage

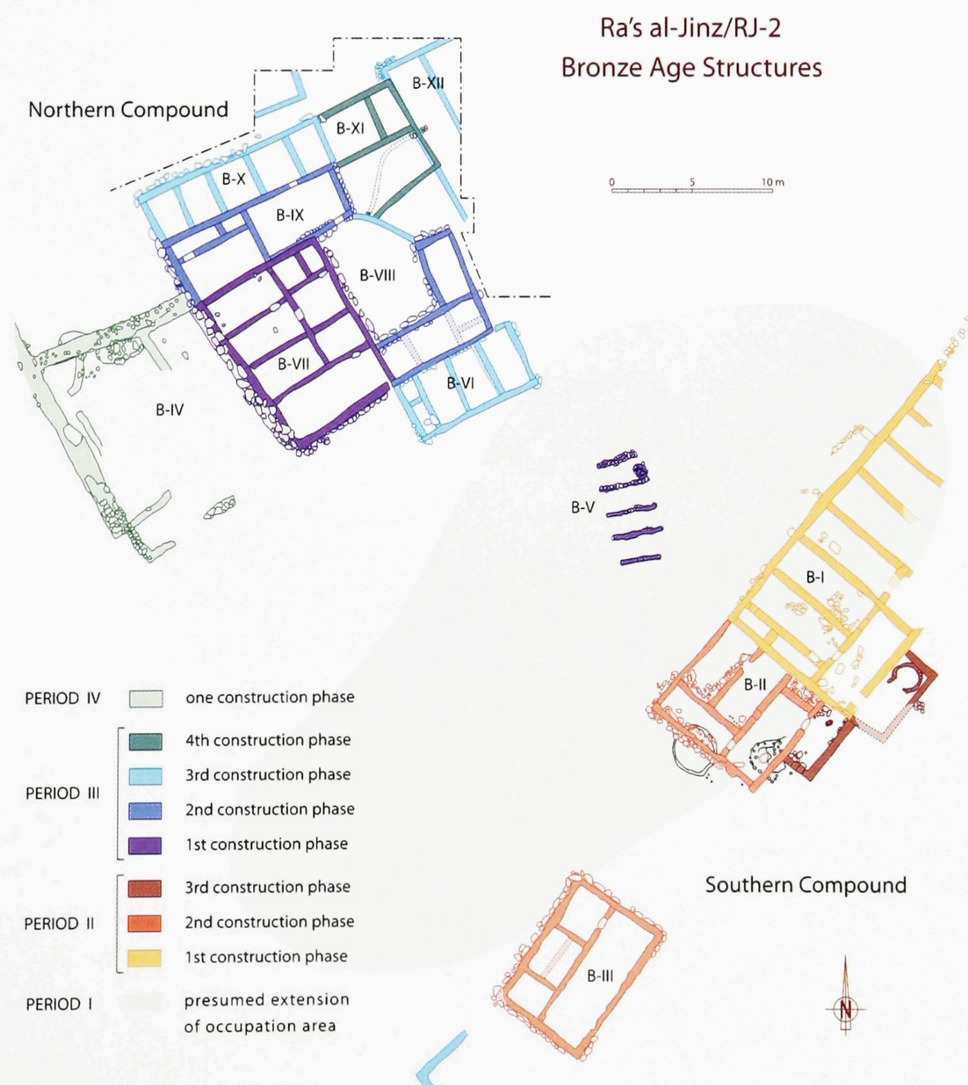


Figure 221:
Map of excavated areas at Ra's Al Jinz RJ-2 (drawing by Hélène David after a general plan compiled by Luca Mariani)



Figure 222:
Ra's Al-Jinz RJ-2: Building II of period II from the south, ca. 2500-2250 BC (photo Joint Hadd Project).



Figure 223 - Ra's Al-Jinz RJ-2: the southern part of building I. In the foreground is a large domestic oven probably for collective use in a small room, ca. 2400-2300 BC (photo Joint Hadd Project).

rooms were added (fig. 222). According to the finds, and in particular the fact that each one had its proper storage facilities, we may conclude that these basic units housed a nuclear family, and the fact that they were clustered together in a single construction suggests that these nuclear families were part of a larger kinship group that had built the house compound (fig. 253). The northern compound involved successive extensions, starting from a large eight-roomed house that was developed in order to include a "courtyard" devoted to domestic activities (fig. 225-227); and here again the compound can be understood as the residence of several kin-related nuclear families. We will look later in more detail at life at Ra's Al-Jinz itself. These were the temporary houses of a fishing community and some aspects of their use may not be fully significant for the way people lived in the oases of the interior, although we must consider that this organisation of housing is probably similar to what also prevailed there. Access from outside and to each room was through elevated doorsills some forty centimetres high, to prevent both animals and sand entering the house. Such a feature was also recognised at Umm an-Nar. No house was preserved enough to reveal how they were roofed, but one can probably suggest a flat roof made of palm tree beams covered with mats and earth, rather similar to the traditional ceilings of Oman. The space to be covered was generally nar-



Figure 224:
A model of buildings I, II and III (from left to right), with some of the various activities carried out by the inhabitants of Ra's Al-Jinz during their winter stay in the village (Joint Hadd Project and Musée des sciences et techniques, Paris / Vincent Charpentier).

row, never more than two meters and a half, so this would not have been a problem. In the courtyard of a house at Al-Moyassar was found an underground cistern designed to store rainwater channelled from the flat roof (fig. 229), and a similar device seems to have existed in the northern compound at Ra's Al-Jinz (fig. 228). These interesting features indicate that wells were not the only way to obtain water, and the collection of rain added good quality drinking water to the resources available.

The general setting of the large oases at Bat, Bisya or Hili has already been described in a previous chapter. Al-Moyassar in Wadi Samad was a rather small site, but its excavations provided extremely important information on the exploitation of copper during the third millennium BC (window 8). It had at least one round tower made of an outer wall of stone with an inner structure of mud-bricks that was equipped with a fifteen metre deep well (fig. 151). Small veins of copper were exploited



Figure 225:
Ra's Al-Jinz RJ-2: the northern compound of buildings. In the foreground is a courtyard with ovens for domestic activities (photo Joint Hadd Project).



Figure 226:
Ra's Al-Jinz RJ-2: vertical photograph from a kite of the northern compound of buildings, Period III, ca. 2300-2100 BC (Photo Joint Hadd Project / Eugenio Bortolini).

Figure 227:
Ra's Al-Jinz RJ-2: the northern part of the northern compound of buildings (Bldg. IX, left, and X, right). Period III, ca. 2300-2100 BC (photo Joint Hadd Project).





Figure 228: Ra's Al-Jinz RJ-2: remains of a probable water channel carrying rain water from the northern compound to an underground cistern, ca. 2300 BC (photo Joint Hadd Project).



Figure 229 – Hot air balloon photograph of a drain carrying water to an underground cistern at Al-Moyassar (photo German Mining Museum, Bochum).

nearby and the metal may have been processed on the site, notably in the courtyard of the houses. Several Umm an-Nar type collective burials have been located and one of them excavated. At present most of the finds date from between 2400 and 2000 BC, but we may conclude from the presence of Hafit-type graves that the area was settled much earlier.

Old Crafts Improved and New Ones Developed

Among the new developments in the material culture of the oases is the production and use of pottery on a much larger scale than before. According to the excavations at Hili 8, this probably started around 2600 BC. From this time onwards the main type of pottery in use is orange ware of a sandy texture, covered all over with a red slip - a thin layer of red clay applied before the pottery was fired - and decorated with geometric patterns in black paint (fig. 230, 231). The shapes are simple and utilitarian, mainly involving small or medium-sized pots with a hole mouth or very short neck, shallow cooking pots, and bowls. Their decoration mainly con-

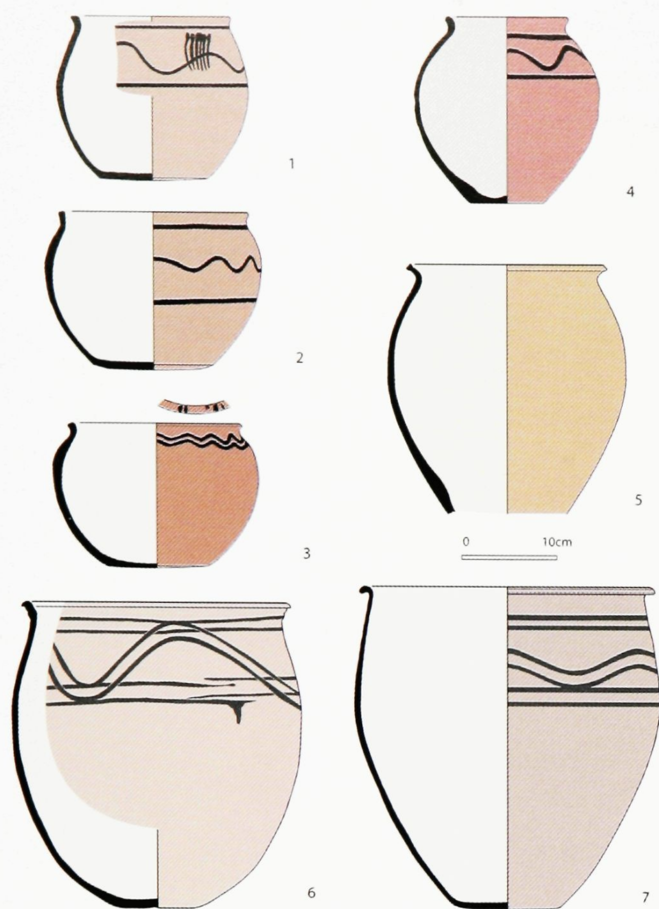


Figure 230 – Common pottery for daily use found at Hili (1-4), Ra's Al-Jinz (5) and Al-Moyassar (6-7), last centuries of the 3rd millennium BC (drawing by Hélène David).



Figure 231 - Common pots for daily use are also found in the tombs. These originate from tomb A at Hili North (photo French Archaeological Mission to Abu Dhabi).

sists of various associations of horizontal wavy lines in between horizontal lines on the upper part of the vessels. More rarely, spirals and criss-crossed or hatched wavy bands and lenses occur. This type of pottery had been produced earlier, but only in very small quantities. Other classes of pottery which had also been produced in previous centuries continue, but their function changes. For instance, the pottery that seems to have been mostly used at Hili between 2800 and 2600 BC, though on a restricted scale, was a fine light red ware, painted in various patterns of zigzags and chevrons and mainly consisting of medium-sized jars. This was a model of pottery with definite Iranian affinities in fabric, shape, and decoration, but which was determined as locally made after chemical analysis (fig. 168, 169). By the middle of the third millennium BC this type of pottery is still produced, but almost only as small jars, and almost only for depositing in graves, with no use in everyday life (fig. 232). Thus it joins other categories of pottery that are exclusively used in burials, like, for instance, small globular pots with a short everted neck and four suspension lugs on the shoulder, decorated with a black painted lattice on a buff or red fabric.

The distribution and production of these particular categories of pottery across Oman is highly informative. At present, fine ware for funerary use is found all over the country, from Musandam to the Ja'alan area. Its shape, style of decoration, and paste are so standardised and similar that they can be considered as having been produced in a few centres. These centres remain unknown, but the chemical composition of the clays used to make the pottery indicates that they were located in Oman. Their discovery would be a major breakthrough for archaeological research. Meanwhile, we must suppose that they will be found somewhere in the heartland of the Oman interior, possibly not too far from the main copper mines, as the models of these objects, in terms of shape, decoration and production technique, originate, like copper metallurgy, from south-eastern Iran. Considering the importance of graves and grave goods in Magan society, this must have formed an important aspect of the exchange network inside the country. This pottery was even traded



Figure 232 – By 2600 BC, fine black-on-red painted ware in Iranian style was still locally made, probably in a few particular workshops across the country, to be deposited in graves (drawing by Hélène David).

internationally. It reached the country of Dilmun, where it has been found in the earliest levels of Qala'at Al-Bahrain, the so-called City I dating from the 24th-23rd centuries BC; in the graves at Rifa'at also on Bahrain island (fig. 233), and in the Eastern Province of Saudi Arabia at the large burial sites of Abqaiq and on the settlement sit of Umm an-Nussi.

On the other hand, the orange sandy ware for domestic use found at Hili was certainly produced somewhere in the area. Its distribution is restricted to the Buraimi region and only a few examples are found elsewhere, at Bat, Umm an-Nar or Al-Abraq, where it clearly appears different from the bulk of domestic pottery used at these sites, and is probably an occasional import from Buraimi. Although its basic shapes and decorative designs are rather similar, the pottery produced at Hili, Bat or Al-Moyassar can be easily differentiated. Every major settlement area probably had its own pottery production for daily use when, by the middle of the third millennium BC, this became a basic commodity of everyday

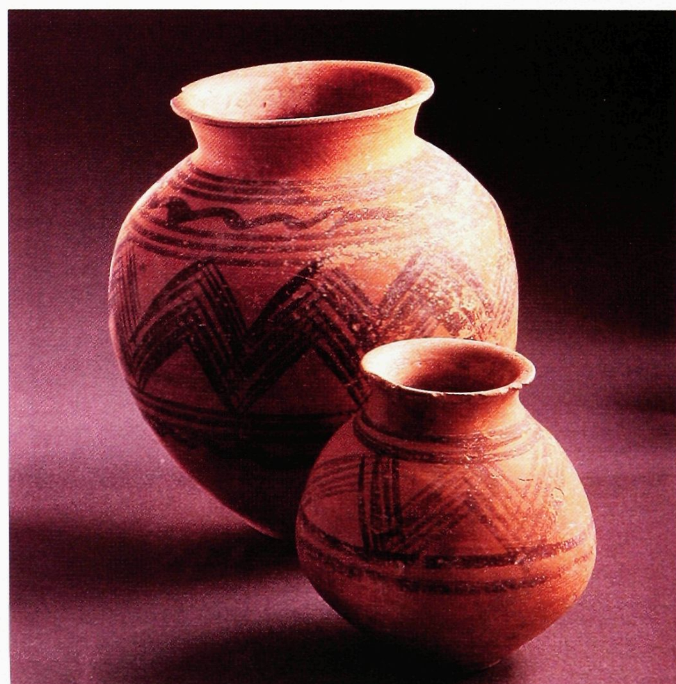


Figure 233 – These fine items of black-on-red painted ware were found in graves at Bahrain and have been demonstrated to come from the Oman peninsula by chemical analysis. They can be dated to ca. 2400 BC (after Lombard ed. 1999).

Figure 234
These chlorite vessels known to archaeologists as série ancienne or intercultural style are found in Iran (3-4), Mesopotamia and the Gulf. They were probably produced in south-eastern Iran, notably at Jiroft, where they were put in graves, while in Mesopotamia they are mainly found in temples (1-2). The inner part of n.2 carries a dedicatory Sumerian inscription in the name of King Rimush, ca. 2600-2500 BC. Except for a few sherds at Umm an-Nar or Kalba, these had not been found until now in the Oman peninsula (composition made after various sources).

life. The exchange networks supplied instead the fine painted pottery for vital funerary rituals.

Soapstone vessels represent another important and characteristic item of the Early Bronze Age culture of Oman during this period. They are carved in locally available material, steatite or chlorite, that had long since been known to Oman's prehistoric inhabitants, who used it to make beads and ear rings during the fourth millennium BC. These soapstone vases have been for long a well-known object in Gulf archaeology. For a long time, mostly between the 28th and 25th centuries BC, they were produced in Iran and possibly at Tarut in Saudi Arabia in a fine carved style with engraved mythological scenes (fig. 234). They reflect what is called an "intercultural style", so-called because their decoration seems to represent themes and patterns that would

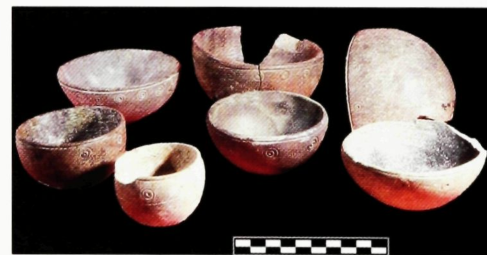


Figure 235:
These chlorite vessels are known to archaeologists as série récente. They have been shown to be a typical product of Oman during the last centuries of the 3rd millennium BC. Mainly found in graves, they were probably deposited with some luxury contents (food or cosmetics). They are also found all over the Gulf up to Mesopotamia (photo French Archaelogical Mission to Abu Dhabi).

be understood in both regions, and they are found all over Mesopotamia, and at Susa, where they were certainly imported from the east and south. They are, however, unknown in Oman, except for one or two pieces, clearly imported, found in early Umm an-Nar graves. By 2400 BC, however, proper local production starts in Oman. Examples mainly include hemispherical bowls (fig. 235), cylindrical beakers, and rectangular boxes divided into two compartments. The beakers and boxes are provided with a circular or rectangular lid (fig. 236). Their decoration consists only of double concentric circles with a dot at the centre, executed with a three-pointed trepan turning on one of the outer points and consistently arranged on the vessel. The hemispherical bowls have one single row of circles below the rim, while the body of the beakers and the boxes was entirely covered. Another and less common type of beaker had a beehive shape and was decorated with parallel grooves all over its body.

Although similar vessels are also found at Tarut, there can be no doubt, given the type of stone used, that it was an Omani product. The care devoted to manufacture and decoration varies considerably from one piece to another, and there were probably many workshops that made them at places where the material was available - almost everywhere in the ophiolite mountains. Most of these objects were found in the Umm an-Nar type graves, but only in the most recent ones. They are, for instance, absent from tomb Hili M, dated ca. 2750-2500 BC, from as-Sufouh near Dubai, dated ca. 2600-2400 BC, and from Umm an-Nar itself, that may have been abandoned around 2300 BC. In tomb A at Hili north, on the other hand, they were found by the dozen, the most common by far being, as everywhere, the hemispherical bowls (sixty-three) followed by the boxes (six), the conical beakers (three), and the beehive beakers (two). Comparable numbers of soapstone vessels have been found in many other late Umm an-Nar graves such as at Mowaihat, Bat, Al-Moyassar, etc. Similar vessels, mostly fragmented, appear in late third millennium BC layers at settlement sites like Hili, Abraq, Al-Moyassar or Ra's Al-Jinz. Their shape was not utilitarian and none, except by accident, bears the traces of fire that they would show if, like modern soapstone vessels in Yemen, they had been used as cooking pots. We have suggested in chapter 7 that they could have been used as attractive containers for high added-value food preparations with honey and date products or for frangrances. In keeping with their own intrinsic value, they would have been used many times before being eventually deposited in a tomb with a deceased member of the community; and they were strong enough to break only exceptionally during use in the settlements, where they are rarely found. Like the fine painted ware, they and their contents also entered the international exchange circuit.

Apart from the export of copper, there was very probably some local metallurgy, although little is known about it. Two coppersmith's workshops dating from ca. 2400 BC and 2250 BC were found at Hili 8, and others are known at Umm an-Nar and Al-Moyassar, where fragments of clay moulds have been found. The main objects produced by casting seem to have been long flat celts, flat-tanged spearheads, and tanged daggers (fig. 129, 237, 239). These have been found mainly in graves, especially at Umm an-Nar, Al-Sufouh, Hili, Kalba, and Al-Moyassar. If the celts were most probably tools, the spearheads and daggers are obviously weapons. These apart, small mundane objects like pins and rings were produced by cold hammering, and so were fishhooks at the coastal sites (fig. 238). In addition, we cannot rule out that copper vessels were also produced, but these are fragile items rarely preserved unless deposited in graves, and here again they are likely to disappear due to later plundering. Re-use of the metal by the coppersmiths and grave plundering have probably led us to underestimate the importance of copper metallurgy and the use of copper tools in Oman during the third millennium BC.

Coastal Settlements and Gulf Trade.

Several coastal settlements are known in detail from archaeological excavation on both sides of the peninsula. Some were located where both fishing and agriculture could be done. This is the case of Al-Abraq on the Gulf coast, near the modern town of



Figure 236 – A série récente chlorite vessel still with its circular lid found in a bone pit at Bahla (photo Joint Hadd Project).

Umm Al-Qawayn, or Bidiya on the Arabian Sea coast, not far from Khor Fakkan, or Kalba, south of Fujairah. In these cases, little is known from the general organisation of the settlement as excavations have been too limited, but in every case we note the presence of towers similar to those of the interior. Other coastal settlements are located in places that are presently unsuitable for agriculture and which were certainly already relatively unsuitable in the third millennium BC. The most important ones are at Umm an-Nar and in the Ja'alan, at Ra's Al-Hadd, Ra's Al-Jinz, and as-Suwayh. They represent developments of the earliest fishing villages that are now fully integrated into the economy of the interior.

The settlement at Umm an-Nar was on a small island amidst shallow waters and partly surrounded by mangrove swamps. Its stone houses, which may have reached over a dozen in number, clustered along a little bay, with one or two isolated larger buildings some fifty metres away. These houses were built around 2600 BC, or slightly later, above the remains of circular huts that represented the dwellings of the first inhabitants of the site back in ca. 2750 BC. Their rectangular rooms were rebuilt several times between ca. 2600 and 2300 BC and did not yield any clear plan. The inhabitants were engaged in fishing and catching sea mammals like dugongs and dolphins, as well as a few sea turtles. They occasionally also butchered stranded whales. We do not know if the site was occupied all the year round, or if it was only seasonally settled in winter, as Ra's Al-Jinz appears to have been on the opposite side of the country. This depends on resources and navigation patterns in the Gulf that seem more evenly distributed throughout the year than they appear to have been at places like Ra's Al-Jinz. Fishing in the Gulf waters would not have been a problem at any time, nor would navigation there, although winter may have been better for boats sailing towards

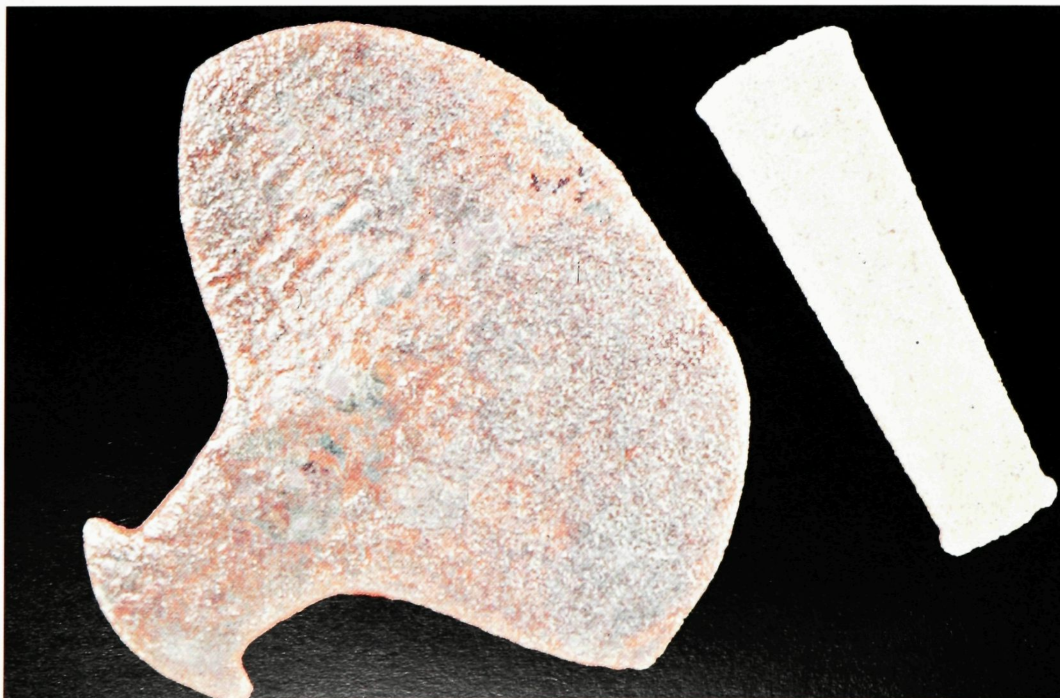


Figure 237: Ra's Al-Jinz RJ-2: a copper axe and a copper adze from the northern compound, period III, ca. 2200 BC (photo Joint Hadd Project)

Mesopotamia (window 7.4). It is also to be recalled that diving for pearls, which was already practised (although we lack any direct evidence for this at Umm an-Nar) is a summer activity that would have kept some of the people on the coast.

In daily life the inhabitants of Umm an-Nar used a variety of pottery that qualified as "local", although we do not know exactly where this pottery was made. Some of it displays similarities with ware from Bahrain and south-eastern Iran but is not found in the interior. This is a kind of light red jar decorated with undulated cordons that end in snakes' heads. Others display similarities with the kitchenware of the eastern Saudi Arabian sites in the Dhahran region. Mesopotamian potteries, mainly medium-sized jars, came through the Gulf trading network, mainly as containers, and were locally re-used. A few painted examples of the type known at Hili also reached Umm an-Nar. It is interesting to note that if Mesopotamian pots were found in the tombs, they were imported vessels for daily use and transport and no longer the small painted jars specially imported to be deposited in Hafit type graves by the early third millennium BC. The community of Umm an-Nar mainly imported for funerary use the fine black-on-red painted ware of the interior, like all communities of Early Bronze Age Oman, also adding some fine products of south-eastern Iranian origin, like fine grey ware painted with friezes of caprids or incised with geometric patterns. The community had copper tools, including fishhooks and various kinds of needles, drills, sickles and adzes. Fragments of moulds indicate that copper was also worked on the site. No flint tools were found, although low quality flint is present on the island. Umm an-Nar means in Arabic "the mother of fire", since those flints were used for kindling in historical times.



Figure 238 - Ra's Al-Jinz RJ-2: three of the hundreds of copper fishhooks found on the site (photo Joint Hadd Project).



Figure 239 – Suwayh SWY-3: a late 3rd millennium copper spear found on the surface of the site (photo Joint Hadd Project)

A large isolated building was thought to be a warehouse. It contained an unusual number of storage jars and lids. Most of the jars were imported from Mesopotamia while the lids appear to be "local" ware. In this same house were found a series of carefully shaped stones, most of them in hematite, that are tentatively considered to be weights. They range from 7.9 grams, which would correspond to the standard weight unit (shekel) used at Ebla in Syria at the same period, to 232.1 grams (more or less 30 Ebla shekels). This correspondence with the northern Syrian standard rather than with the Mesopotamian standard (one Mesopotamian shekel being 8.5 grams) may be of interest, considering that also a cylinder-seal impression of North Syrian type was found on the shoulder of a storage jar inside the warehouse (fig. 191). Cylinder seals are a distinctive item of Mesopotamian administrative usage, and were extremely widespread from the middle of the fourth millennium BC. The impression at Umm an-Nar is the only example known in Oman during the Early Bronze Age. The settlement was obviously trading with the Gulf countries and beyond, exporting the bun-shaped ingots of copper produced in the interior (although none has been found on the site). In exchange, it received from Mesopotamia a wide array of goods coming in jars and other containers.

The Mesopotamian texts mention many items like food (wheat and barley in the shape of grain or flour, sesame oil, etc.) and fabrics that will never be found by archaeologists. The consumption and redistribution of these goods towards the interior was certainly at the root of the wealth of the Umm an-Nar community, well seen in offerings in the collective graves that overlook the village from a nearby limestone cliff. Another commodity not mentioned in the texts but discovered by archaeologists is bitumen, which was found in various shapes and notably as coating for reed and wooden boats. Umm an-Nar can, therefore, be considered as having acted as a main port of trade between the oases of the interior, from Hili to the south along the Hajjar Mountains. The various classes of fine painted pottery deposited in the graves and several vessels of the orange sandy painted ware in use at Hili for domestic purposes probably originate from the Buraimi area, and came there together with copper and oasis produce like dates to be loaded onto boats. But it was also a dot in a network of coastal sites that dot the Gulf coast from Musandam to the borders of the Qatar peninsula. Some sites may just have been seasonal fishing stations, like that found at Ra's Ghanada; others were permanent settlements also engaged in agriculture, like al-Abraq and those in the region of Ra's Al-Khaimah (Shimal); but all probably benefited from the commodities brought by an international trade in which they did their best to participate.

The warehouse at Umm an-Nar seems to have been abandoned around 2400 BC and the site itself one or two centuries later. The reason still eludes us. It cannot, however, be related to a crisis in the copper trade, because, on the contrary, this is the time when the trade is best documented in cuneiform texts from Mesopotamia and other sites like al-Abraq are still settled and very active in it. The cause is more probably related to local conditions. General models of sea levels indicate a lowering of two or three metres between 2300 and 2000 BC, and in the flat coastal areas of the Gulf this would have induced major changes in the landscape, including loss of landing facilities, a more distant sea, and the formation of the sebkha environment that nowadays characterises the surroundings of the site. In fact, this sebkha dates back to ca. 2000 BC, according to geologists who independently studied its formation without knowing about the presence of an archaeological site there. We can therefore suppose that copper shipments would be loaded from other places along the coast, keeping in mind that availability of fresh water and easy communications with the interior were constraining factors. A site like Al-Abraq near Umm Al-Qawayn meets these criteria and



Figure 240 – Helicopter view of the Ra's Al-Jinz cape, with 4th millennium sites RJ-40 and RJ-41 on its top near the sea (photo Joint Hadd Project).



Figure 241: The central plateau (Al-Hawra) in the Ra's Al-Jinz embayment. Site RJ-1 is on the plateau while site RJ-2 is at the bottom in the foreground and site RJ-3 is on the left side of the picture. Note the small craters dug by nesting sea turtles near the sea (photo Joint Hadd Project)

many objects originating from Mesopotamia, Bahrain, and eastern Iran have been found there, suggesting that the main flourishing of its occupation dates from the last centuries of the 3rd millennium BC, after the abandonment of Umm an-Nar. But it is not the only site and we can assume that several others are still to be found in the Dubai or Sharjah areas. Both the Dubai and Sharjah creeks were certainly very attractive points of anchorage, sheltered and with good connections to the interior, just like the Umm Al-Qawayn lagoons. Less than fifty kilometres separate them from the modern oases of Dhayd and Mleiha that were probably rich farming areas in the interior already in the third millennium BC. Umm an-Nar type tombs are known at Al-Sufouh south of Dubai, dating from around 2500 BC, and at Muwailah near Sharjah, dating from around 2200-2000 BC, and these were certainly associated with settlements now gone or still to be found. We may suppose that there was not only one port along the coast and that trade routes changed according to the vagaries of nature and the vicissitudes of competition between human communities.

Ra's Al-Jinz and the Ja'alan: the Land of Magan at the Edge of the Ocean

On the opposite side of the Oman peninsula, and at the other end of the chain of oases along the foot of the Hajjar mountains, the archaeological sites of eastern Ja'alan provide excellent information about

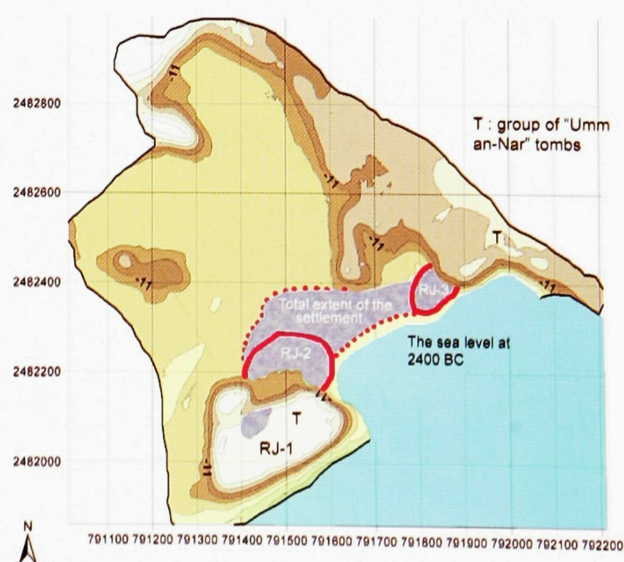


Figure 242 – A map of the village of Ra's Al-Jinz as it probably was around 2400 BC (Joint Hadd Project / Eugenio Bortolini).



Figure 243 - Ra's Al-Jinz RJ-2: heads of large tuna fish thrown with large stones into a pit after the catches were processed, period III, ca. 2200 BC (photo Joint Hadd Project).

the coastal settlements along the Arabian Sea coast during the same period, with an emphasis on maritime trade directed towards India and South Arabia over the open sea. Other sites from this period are known along the Oman coast, although none has been excavated or else was found already destroyed, notably at Bandar Jissa, Quriyat and Bimmah; and many others probably existed along the Batinah coast or near Sur. But the Ja'alan sites occupy a very special position. Considered from the sea, they are located at the true hinge between the Gulf of Oman and the Arabian Sea; considered from the land, they are located at the end of the long corridor of communication that leaves the Gulf coast, reaches across the sands to Buraimi, and then along the southern piedmont of the Hajjar Mountains, where it meets the sea.

There are settlements from the second part of the third millennium BC at Ra's Al-Hadd (mainly sites HD-1 and HD-5), at Ra's Al-Jinz site RJ-2, and at as-Suwayh site SWY-3. Test trenches were dug at HD-1 and SWY-3 and large excavations at RJ-2. In

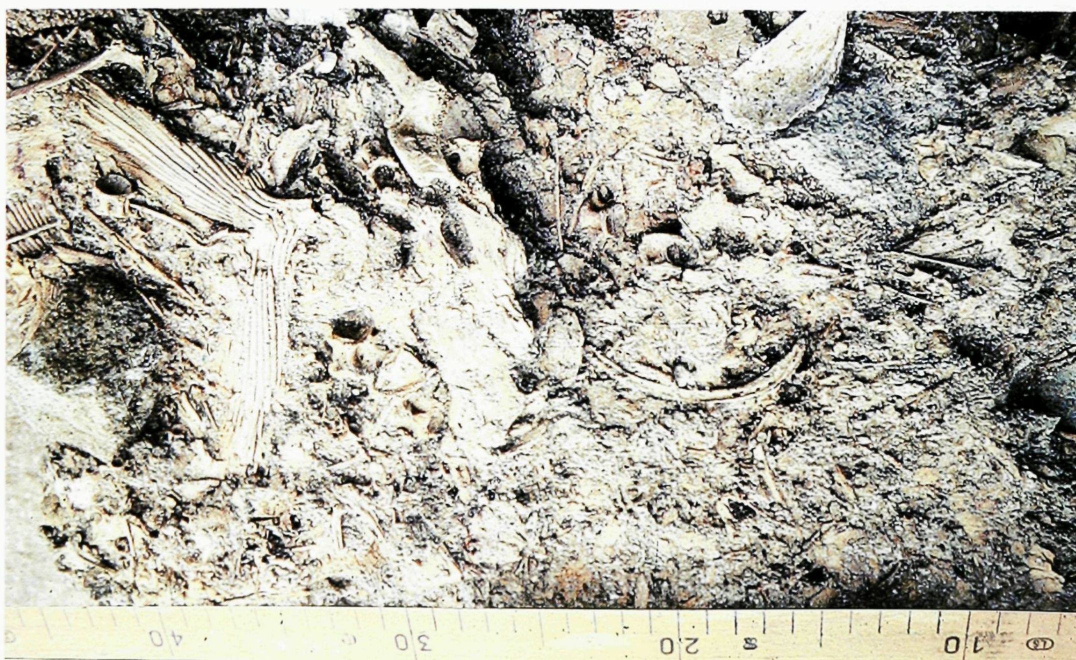


Figure 244 – Remains of the filleting of tuna fish on the floor of a small room transformed into an open shelter, probably from period III around 2300 BC (photo Joint Hadd Project).

addition, two other coastal settlements are known from surface finds at Ra's ar-Ruways (site RWY-3) and north of Aseelah (site ASL-1), although they are rather poorly preserved.

Excavations at Ra's Al-Jinz have yielded a vivid picture of a fishing community belonging to Oman's Early Bronze Civilisation during the second part of the third millennium BC. The site is located along a sandy beach breaking through limestone cliffs just south of the true easternmost headland of Arabia (fig. 240). Like the whole of the Ja'alan, the area was populated from the sixth millennium BC onwards and many sites have been located and tested. The main Early Bronze Age site was settled along a small bay and consisted of several groups of mud-brick houses already described (fig. 241). Its occupation started around 2500 BC, at the same time the warehouse at Umm an-Nar was built, and continued until the end of the third millennium. It was inhabited seasonally during winter, from October to March, by a community that spent its time fishing and processing catches in various ways to store and ship them to the interior, where the people of Ra's Al-Jinz themselves also spent the summer months. The seasonal character of the settlement has been confirmed



Figure 245: Ra's Al-Jinz RJ-2: circular trench and postholes remaining from light shelters built after the destruction of building II, period III, ca. 2200 BC (photo Joint Hadd Project).



Figure 246 - Ra's Al-Jinz RJ-2: Five low parallel walls, each two metres long, built of stones and mud. They belong to the beginning of period III, ca. 3000 BC. Such structures are often interpreted as storage facilities, to keep food or grains on the ground safe from predatory animals or pests. We suggest that these may be interpreted as a storage system for fishing boats, especially for the time when fishing was impossible and the village was empty during the summer monsoon (photo Joint Hadd Project).

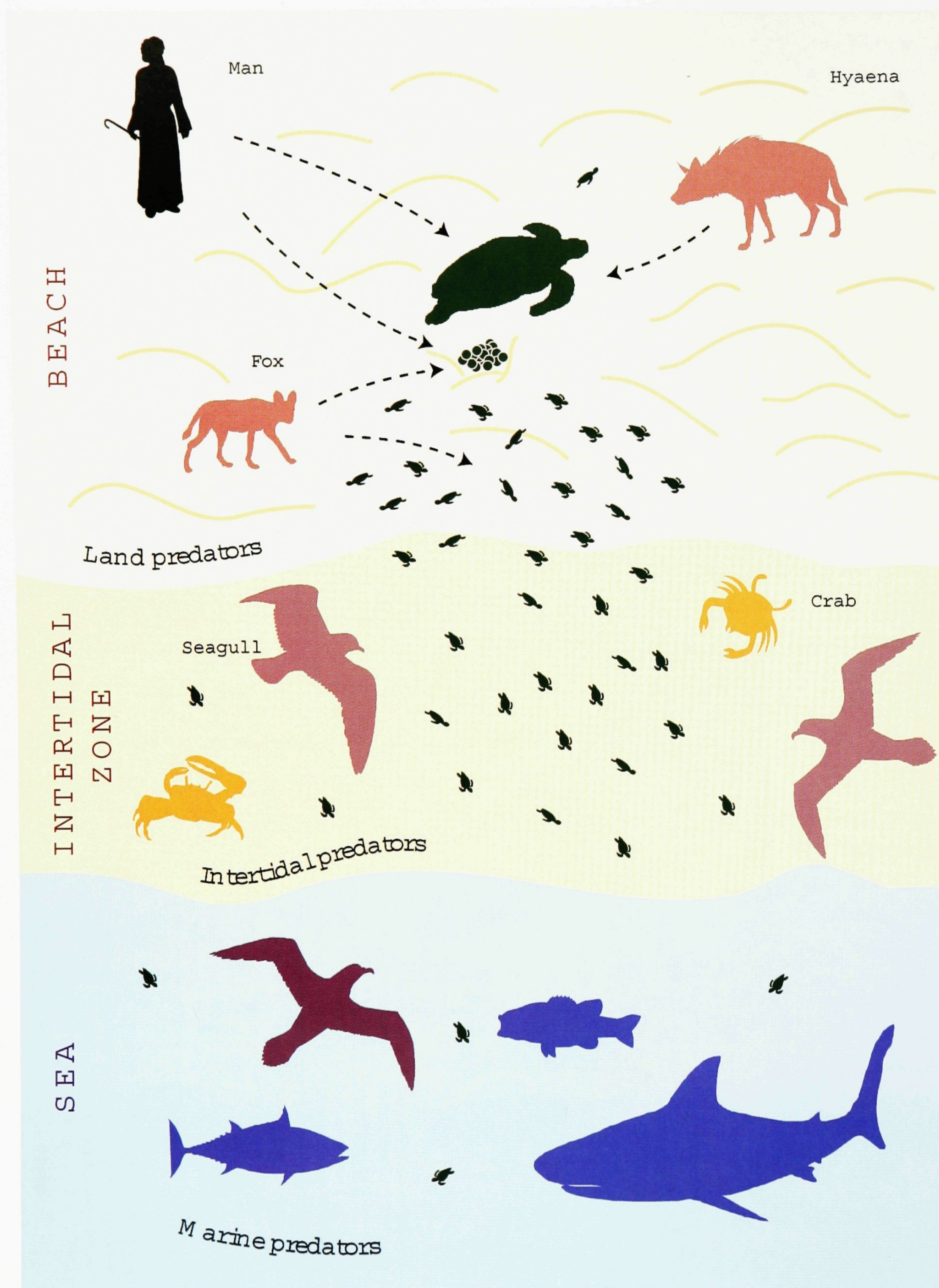


Figure 247 – Green turtle (Chelonia mydas) and ecological cycles at Ra's Al-Jinz. This now protected sea reptile was an important source of food for many animals in the sea, on the beach and on land, especially as far as eggs and hatchlings are concerned. Its meat and fat were of high importance for men, although we can assume that, due to the restricted size of human communities, and also to the fact that most nesting happens in summer, these removals from the trophic chain were never important enough to endanger the species (drawing by Hélène David).


Figure 248 – A date stone found burnt in the layers of Ra's Al-Jinz RJ-2, period III (ca. 2200 BC). The holes in the stone have been made by the small insect on the right, a Coccotripes dactyliperda, which was burnt with the stone. This parasitic insect is endemic among cultivated palm trees (photo Joint Hadd Project / Lorenzo Costantini).

by careful analyses of deposits, although it was first established by the fact that fishing in summer is impossible. The strong surf generated by monsoon winds between May and October make it extremely difficult and dangerous to launch fishing boats from the shore. Even now the whole of this area, including the modern village of Ra's Al-Jinz (fig. 242), is abandoned in summer by its inhabitants, who move to the oases of the lower Wadi Al-Batha or, some of them, to Ra's Al-Hadd, which is sheltered from the monsoon winds by the cape and where fishing is still possible for a few more months in late spring, though it is less rewarding than during the winter season. These easternmost coastlands of Oman are extremely rich in all kinds of marine life, notably during the winter months when large shoals migrate along the coast and can be easily exploited. The variety of fish found in the Ja'alan sites indicates that all the marine ecosystems were exploited, from the seashore to the high seas. The Ra's Al-Jinz fishermen principally concentrated on large species like the yellow-fin tuna fish (fig. 243). These were caught in quantities surplus to the requirements of the community itself and most were processed by drying, smoking and salting. Fishing equipment included nets, of which only the sinkers were found, and lines bearing all sizes of copper hooks. Most fish processing took place in open areas outside the houses, where hundred of ovens and thousands of fishbones were found within sediments comprising burnt stones and ashes - a good indication of the large extent of such activities. In one case, however, it was possible to prove that filleting large fish was done in one of the rooms, but its outer wall had been destroyed and its door opening into another room had been blocked, so that it was no longer part of a house but instead a rather comfortable place to work under the shelter of the roof (fig. 244). Round and square shelters on wooden poles have also been found in the working areas (fig. 245). Two small constructions made of five parallel walls, some fifty centimetres high, two metres long, and one metre from each other, can also be related to fishing (fig. 246). On archaeological sites, such structures are generally interpreted (by comparing them with ethnographically known examples) as storage devices to keep goods off the ground and from invasion by various kinds of insects and rodents. Another possibility is that they were used to safely store fishing boats left capsized during the summer season. This is similar to the way huris, the traditional wooden dugouts commonly used for fishing, have been kept safe till recently.

In addition to fish as the daily staple, *Chelonia mydas*, the green turtle, nowadays the main tourist attraction of the area, was also widely caught and butchered when it came ashore to nest on the beach in front of the site. This was easy prey and its meat, fat, and eggs entered the diet of the fishermen (fig. 247). The people of Ra's Al-Jinz occasionally ate shell-fish, largely mussels, oysters, and a variety of


Figure 249 - Ra's Al-Jinz RJ-6: Four Conus shell rings found in a grave (ca. 3000 BC). Such items were produced throughout the whole 3rd millennium BC (photo Joint Hadd Project).



Figure 250 - The frankincense burner of Ra's Al-Jinz RJ-2 lying where it was originally found. It was mixed with net sinkers and grinding stones in the northern corner of room 9, building IX. It was abandoned there at the end of the fishing season, maybe after a last fumigation. During the summer stay in the interior, the walls crumbled and nobody found it necessary to recover the burner when refurbishing the construction, an indication that it was a rather common object in daily life (photo Joint Hadd Project).

murex, as well as the marine mammals living in the area, usually dolphins and whales. The latter were probably not hunted but butchered when stranded, luckily providing much oil, meat, skins and other items for different household requirements. A few domestic animals, cattle, sheep and goats, were also consumed. The herds were probably kept on the inland steppe for the production of milk rather than food. No farming nowadays is possible in the area because of a lack of water and soil, and these were certainly also absent during the third millennium BC. However, many date stones have been found on the site (fig. 248). We think that they were probably brought by the people when moving back from the oases in autumn or sent in return for dried fish during the winter season as an important item of trade. Not only did they play a dietary role, but their association with burnt fish remains in the processing areas supports the view that they may have been used to add taste to the smoked fish, as still practiced in the southern Red Sea. Hunting and fowling in the steppe and hills of the interior may have had little dietary significance, as only a few gazelle and wild bird bones were found.

The mud-brick houses excavated at Ra's Al-Jinz are at present the best-known example of such dwelling structures in Early Bronze Age Oman and they have already been described. We assume that several similar clusters of houses are still to be found behind the present beach. Probably due to their seasonal occupation, they had almost no inner built features and the floors were simply of beaten sand, although we may suppose that when occupied they were covered with mats. Some rooms, notably the smaller ones, but not only those, obviously had a storage function. Here were found most of the bitumen pieces plus foreign and local objects connected with trade. There is also evidence that basketry items were used for storage and transport. Other rooms, or areas of them, were devoted to craft activities embedded in the household economy. Among those most conspicuous in the archaeological record of every building is the making of small rings from shells of *Conus* (fig. 249) and *Pinctada* (the pearl oyster). In some rooms there is also evidence of small-scale metalworking, probably to repair fishing gear rather than to produce items for exchange. An interesting fact at all the Ja'alan sites, in strong contrast with sites in the interior and on the western coastlands, is the important role still played by flint in the tool kit. If copper hooks and pins were abundantly used, obviously replacing the shell hooks and bone pins of the fourth millennium BC, some other activities were still carried out with flint tools, like the scaling of fish and shell working. The latter was performed with a thick flint blade whose edges and point were used to remove the body of the shell by



Figure 251 - Ra's Al-Jinz RJ-2: This frankincense burner still displayed the traces of the last mixture that was burnt inside it, ca. 2200 BC (photo Joint Hadd Project).

cutting and chiselling the shell's body and end to perforate the apex. Such heavy work rapidly wears out the tools which then have to be replaced, swiftly building up much debris from the deposited material. This is why so many are found on the site. Their supply was not a problem for the Ra's Al-Jinz people, since they had an almost inexhaustible source of material in the limestone layers of the nearby Jabal Salim Khamis that rises immediately behind.

The Ra's Al-Jinz people used pottery, though in restricted amounts. Less than 3000 sherds were found in the excavations, covering some five centuries of occupation. This is a small amount when compared with excavated deposits at Hili, Bat or Al-Moyassar for the same period. It is also a good indication that pottery was not very common, not surprising since it was not locally made and thus had to be brought in. However, only some of the jars, pots and bowls in daily use were sourced from the interior or along trade networks from production areas in Wadi Al-Batha. Vessels imported from the Indus civilisation, mainly represented by large black-slipped pear-shaped jars, make up a significant percentage of these sherds, ca. one third. These were used to transport all kinds of goods from India and were part of the cargo of boats sailing from the Indus.

In the Ja'alan, the main harbours were certainly the Khor Al-Hajar and Khor Al-Jaramah lagoons behind Ra's Al-Hadd itself. Directly, or through these sheltered anchorages, many goods arrived at Ra's Al-Jinz, some still packed in black-slipped jars or other original containers. Among these were foods and fabrics, but also some luxury items such as an elephant ivory comb found in a storage room of the southern compound (fig. 203). The black-slipped jars may have been in great demand by Ra's Al-Jinz fishermen as they could be re-used to pack local products such as cured fish entering the internal trade network. Ra's Al-Jinz was not a major trading port, but its inhabitants benefited from trade by producing items to be exported abroad and to be sent to the interior. In addition to processed fish came the shell rings which could be produced by almost any family unit. Other items entered international trade, like large conch shells, Fasciolaria trapezium, or pyrolusite crushed into a "ready for use" eye-dye packed into valves of locally available Glycimeris cockle-shells. Anyone in the community wintering at Ra's Al-Jinz used some of his spare time, when not fishing or preparing fish, making anything that could enter the channels through which available resources could be transformed into wealth: local and international exchange.

Oman's Earliest *Mabkhara*

One of the most attractive objects at Ra's Al-Jinz was found in the corner of a room in the northern compound. It had been left there, upside down, with a few ordinary tools: net-sinkers, pounders, and grinding stones, probably to be recovered during the next visit (fig. 250-251). It is a four-legged rectangular vessel, carved from a single block of white coarse-grained sandstone and designed in neat proportions: 16 cm long, 12 cm wide and 9 cm high. A shallow rectangular depression is carved on its upper side, 2.4 cm deep, leaving a flat rim with slightly rounded edges. A final fumigation had been done shortly before the occupants left the house, and a patch of greasy burnt material at the room's centre was identified as the residue from burning a mixture of aromatics, probably including frankincense (fig. 251). When people returned to Ra's Al-Jinz, the walls of the room had fallen in. They did not excavate the debris and rebuild the house on the same plan. From two other pieces of a similar vessel found in a pit outside the southern compound and in another room of the northern compound we know that these objects were in rather common use on the site, and so probably was frankincense too. Burning it was, as nowadays, a normal part of sociability in Oman's Early Bronze Age.

Ra's Al-Hadd: a Main Port for International Trade

Ten kilometres north of Ra's Al-Jinz, Ra's Al-Hadd was at this time a definite nodal point of the trade route to India that cut across the Arabian Sea, as it would be in the golden age of Arabian navigation (fig. 252). In his *Kitab Al-Fawa'id fi usul al-bahr wa' l-qawa'id* (The Book of Profitable Things

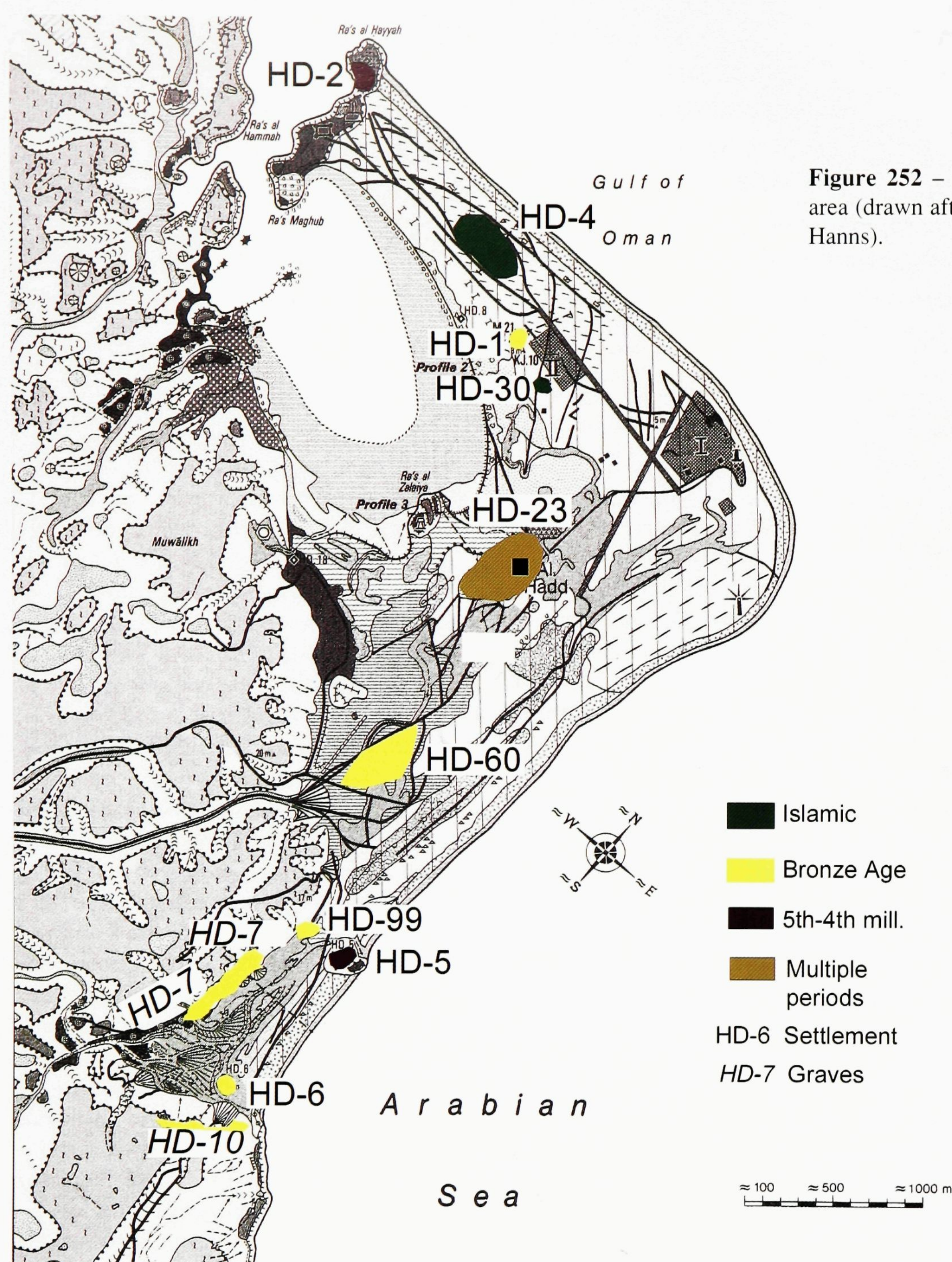


Figure 252 – Main sites in the Ra's Al-Hadd area (drawn after a geological map by Christian Hanns).

Concerning the First Principles and Rules of Navigation) written around 896/1490, the celebrated Omani seafarer Ahmad bin Masjid describes it as the place where the boats changed pilots to cross the sea when favourable marine currents and winds allowed. The Khor Al-Hajar, easily accessible, well protected and separated from the sea by a long sand spit, provided shelter and easy mooring for unloading the boats. A large settlement dating from the eighth to the thirteenth centuries AD (HD-4) has been uncovered on the eastern part of the sand spit, where small soundings yielded, among much local Omani ware, fragments of pottery imported from Syria, Egypt, Iraq, Iran, India, and China, together with some Chinese coins. We are not sure if Sindbad was real or mythical, but if he ever existed he certainly landed at Ra's Al-Hadd!

Surveys at Ra's Al-Hadd yielded various areas where materials from the second part of the third millennium BC were found, like sites HD-5 and HD-99 at the entrance of the southern fossil lagoon, but also at HD-1, west of the present village on the sand spit, a hundred metres away from the present

high tide level at Khor Al-Hajar. We suspect, however, that the main settlement of that period is to be found under the old fort and the surrounding houses that cover a several metres high mound that may well be one of Oman's most important Early Bronze Age archaeological sites. In the meantime, excavations at HD-4 have uncovered only the postholes of light structures and large fireplaces that may have been associated with the workshops. There was also a large amount of Indus type pottery, much larger and more diversified than that found at Ra's Al-Jinz. While the bulk of this Indus pottery is represented by individual dark-slipped jars, with only a few other types of Indus pottery in small amounts, it seems that almost the whole range of Indus pottery types is represented at Ra's Al-Hadd HD-1, suggesting much closer relations with the Indus civilisation than at nearby Ra's Al-Jinz. This is an interesting feature, worth developing for further consideration. We may suppose that, with the growing importance of the trade connection, various non-local groups could have dwelt at least temporarily in this area, and among them perhaps some people from overseas. They may have lived among local people or, more probably, as often happens in similar circumstances, they may have settled separately in nearby compounds, carrying with them at least part of their religious and cultural traditions. We know, for instance, from the cuneiform texts of the early second millennium BC, that a Melluha village existed near the city of Ur. Melluha is the Mesopotamian name for the Indus, and this village may have been

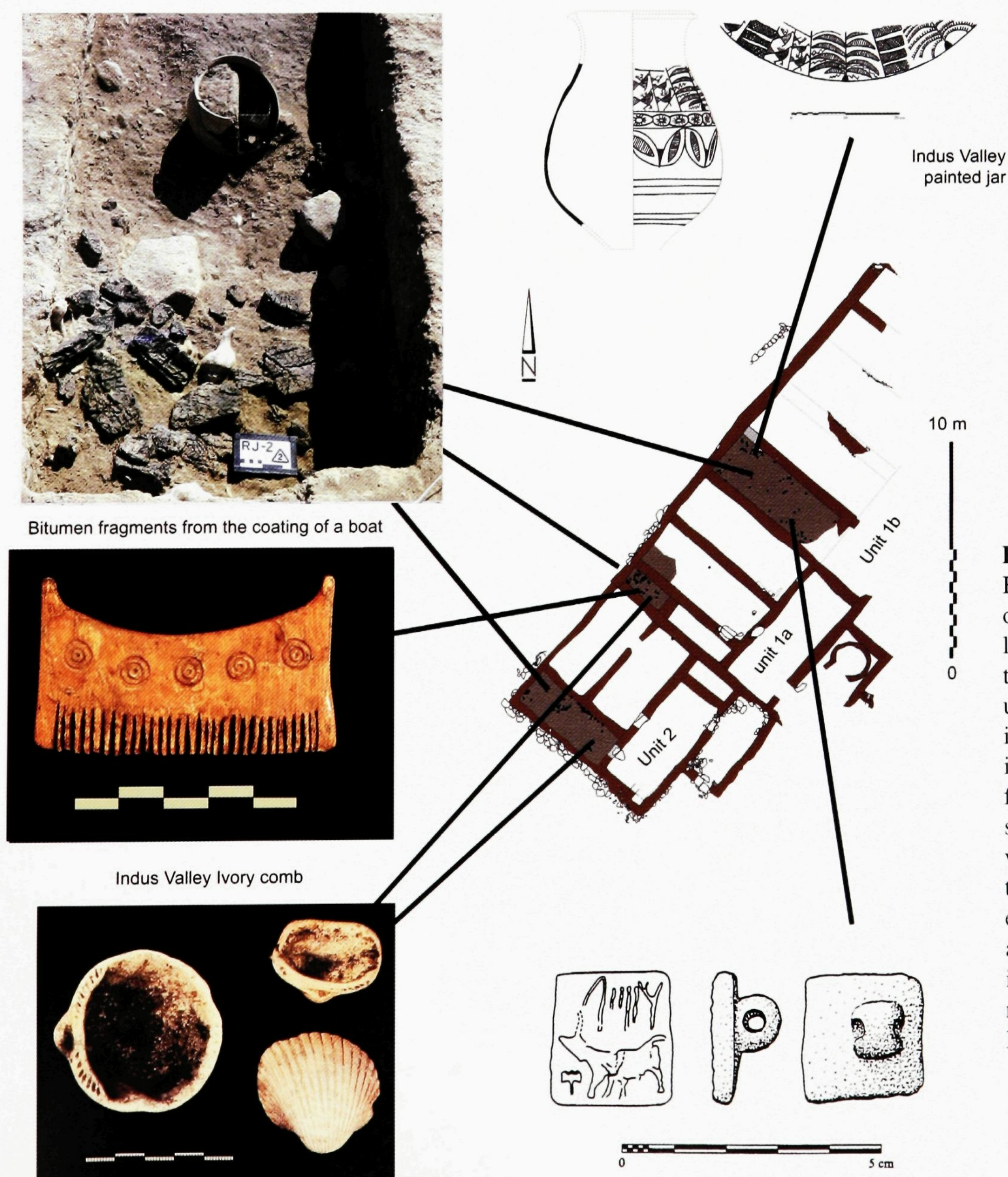


Figure 253 - Ra's Al Jinz, Buildings I and II: distribution of bitumen slabs and objects linked to foreign relations in the three nuclear family living units evidenced in the buildings. The coincidence of imported materials or material for export with the bitumen slabs, a commodity of high value for a fishing community, and their distribution in each unit, can be interpreted as a good indication of a sharing of such things within each nuclear family (the Joint Hadd Project).

where Indian merchants lived who traded with Mesopotamia. The location of HD-1 and the amount and variety of Indus material found there might indicate such a pattern. Distinctive culinary habits are one of the most obvious of these cultural markers that people carry with them and which they try, sometimes desperately, to sustain when they live abroad for a long time. A look at Muscat's main commercial centres is thus highly illustrative. This consideration may be relevant for understanding the



Figure 254 - Ra's Al-Jinz RJ-2: a stamp seal representing two humans standing beside a palm branch found in building VII, ca. 2200 BC. This representation is recurrent throughout the late 3rd millennium BC in the land of Magan and may be a good indication of the importance of alliances among equals in the social and ideological systems of that time (photo Joint Hadd Project).



Figure 255 – This small stamp seal was found in grave 1 at RJ-1 and may be dated to before 2400 BC. It represents a human being and possibly an animal, maybe a saluki dog (photo Joint Hadd Project).

results of recent research on bones recovered at HD-1. As everywhere in coastal Ja'alan, the basis for daily subsistence was fish, supplemented by turtles, marine mammals, and a few terrestrial mammals, among them, the bones suggest, an abnormally large number of dogs. Close study of these bones has shown beyond doubt that they had been butchered for cooking. Dog bones are present at most archaeological sites in Oman, but always in very small numbers and with nothing to suggest that the animals had been eaten. Rather, they could be treated as companions and pets. The complete skeleton of a medium-sized dog beside that of a woman has recently been discovered in a large collective Umm an-Nar grave (Unar 2) at Shimal in the Emirate of Ra's Al-Khaimah, dating from around 2300-2100 BC. The people of Magan gave particular care at least to special dog breeds. This can be traced far back in the Near East, the earliest example coming from Palestine during to the Natufian period, about 10,000 years BC, where a dog was found in the tomb of a young man at the site of Hayonim. Many similar examples are known from Bronze Age Egypt and Mesopotamia. In Oman itself the left jawbone of a dog has been found in a fourth millennium burial at Ra's Al-Hamra, but there is no evidence it was eaten.



Figure 256 - A closer view of the engravings on the southern door-stone at Hili 1059. The scene displays two humans holding hands in between two oryxes, an obviously significant scene that can be related to representations on graves at Adam or on stamp seals at Ra's Al-Jinz (photo French Archaeological Mission to Abu Dhabi).

The butchered dogs of HD-1 have a different meaning: they indicate the temporary dwelling of a foreign community or a local outcast group. Other discoveries of this type may arise in the future.

Magan Society in the Late Third Millennium BC.

Excavations at Ra's Al-Jinz also helped to complement our knowledge of the complexity of Oman's Early Bronze Age society during the late third millennium BC (fig. 253). This society has already been described as kin-based, organised around a few leading families who ruled the towers or lived in them. Several such groups shared power in the main oasis aggregations, probably through relations of cooperation and conflict. This social structure is reflected in the world of the dead by their large collective burials that ritually assert their belonging to the same community as equals, even when during their lifetime some had obviously enjoyed more power than others. Raising the capital and manpower to build towers, aflaj, boats, or to launch overseas trading expeditions necessitated some recognised forms of authority and control over wealth and labour, even if the benefits of such enterprises had to be shared in some way among everyone involved. The pattern of common residence reflected by the houses of Ra's Al-Jinz may tell us of at least one intermediate level of social organisation between nuclear families and the larger communities grouped within the tower compounds. This may have involved several nuclear families, permanently grouped accord-

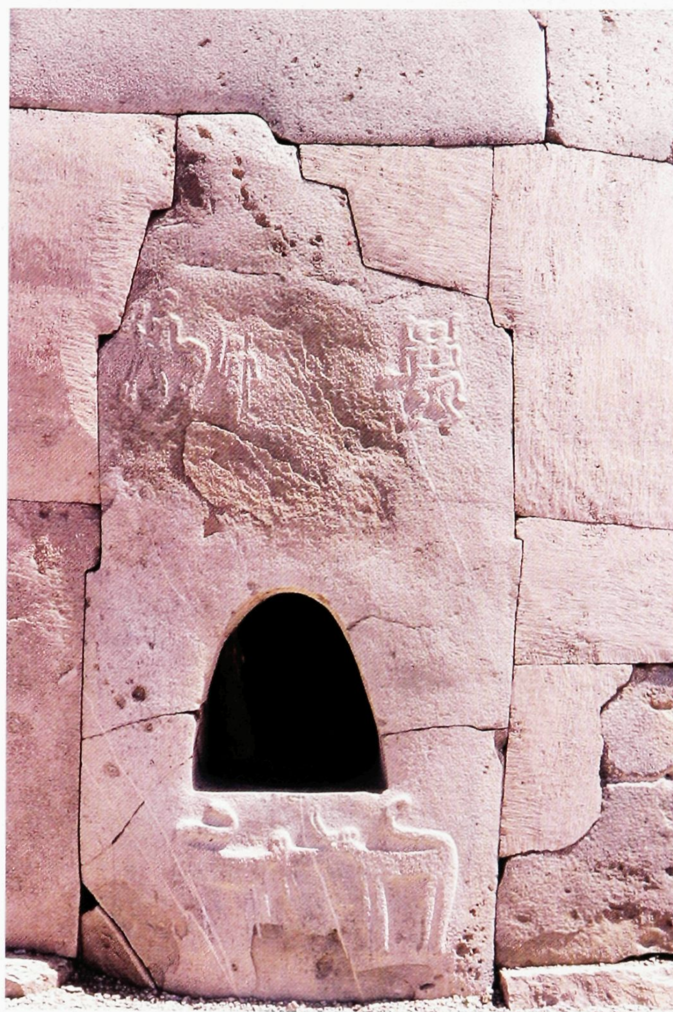


Figure 257 – The northern door of grave 1059, the most complex example of 3rd millennium iconography in the Land of Magan known until now. It represents a man on a donkey and a man holding a spear and a shield (or a bow) on the top left, two human embracing on the top right, and two leopards ripping a gazelle apart (bottom). Although difficult to interpret, these scenes are illustrative of a complex relation between man and animals in the Land of Magan (photo French Archaeological Mission to Abu Dhabi).



Figure 258 – The huge engraving of several figures on the Hasat bin Salt near Al-Hamra, probably from the second part of the 3rd millennium BC. The central figure represents a man wearing a loincloth and brandishing a weapon. A woman wearing a long dress can be seen on the left, and a smaller individual on the right. Both the rock and the nearby mountain were perhaps a cultic or large gathering place (photo Serge Cleuziou).

ing to a kinship maintained by matrimonial alliances, which lived within the same residential compound and might divide for part of the year according to scheduled activities. From both the southern and northern compound we know that food preparation was probably collective but that other activities like making shell rings remained at a nuclear family level. From the southern compound of houses we may even assume that fishing boats, tools for the most important activity, were operated at a nuclear family level, as each house had its own stock of bitumen.

Such nuclear family groupings probably corresponded to the early third millennium BC "Hafit type" tombs, while with time the dead also became organised at a "tower" level in the larger multi-chambered "Umm an-Nar" type burials. The growing monumental aspect they reached towards the end of the third millennium BC illustrates both prestige competition among lineages and general wealth reached at this time by the people of Magan. Inside the graves, the division into two strictly non-communicant halves, where men and women, adults and children, were buried all together, probably suggests that, even in the afterlife, members of a residential community were arranged according to their kin affiliation, regardless of whether they were born into the group or had acquired membership during their lifetime.

A steatite stamp seal may help us to throw more light on the mechanisms of social architecture and political relationships. It was found at Ra's Al-Jinz inside the main unit of the northern compound and dated to between 2300 and 2200 BC. The seal is rectangular and was carefully engraved by drilling on the bottom part of the lid of a rectangular box, with the representation of two individuals holding hands beside a vegetal motif - possibly a palm branch (fig. 254). Human representation is unusual in the rare figurative art of Magan. But this subject is displayed on two other examples: a smaller stamp seal of the same period recovered during the excavations of a tower at Kalba and the bas-relief carved on the southern door of tomb 1051 at Hili, one of the most monumental graves presently known and dating from around 2300 BC. The latter represents two individuals very close in attitude to those of the Ra's Al-Jinz seal, holding hands while standing between two oryxes (fig. 256). One is tempted to interpret these three representations as illustrating an "alliance" between individuals and the kin-groups to which they were affiliated. Alliance between fami-

lies, with its periodic affirmation and renewal, underlies any tribal politics in traditional Arabia and was probably already the basic mechanism for the Early Bronze Age people of Magan. The discovery context is itself illustrative. In the same house at Ra's Al-Jinz were found two small stamp seals with three engraved writing characters (see below), a complete incense burner, a piece of another one, and a fragment of the upper jawbone of a leopard. Such a bone would have come into the house with the complete skin of this rare and secretive animal, whose skin is known to have been ritually worn by important individuals in various civilisations of the ancient Orient. In other words, we found the symbol of alliance associated with an individual who may have played a prominent role at the second level of society, that of the extended family group. At Hili the same representation appears on a monument of the third level, that of the "tower" related group, associated with wild animals of no direct economic value (they were not eaten on the site) but of major ideological significance. More information is needed to go beyond these preliminary statements, but this may indicate that the expression and renewal of alliance was symbolically present at all social levels. It was the organising concept of the society.

Keeping this in mind, we should move to the higher levels of the social structure. Was there an ruling lineage over the tower-related groups? And if so, what was it? Was there an authority over the various groups in the same oasis? Although this cannot be ruled out, it is tempting to answer no. Beyond variations related to competition among equals, there does not appear to have been any tower different from the others, or any type of different monument that could represent, like the palaces of Mesopotamian cities, a place where a leader at oasis level would have been settled. It is much more probable that although one or two individuals associated with a tower may have had a leading role among the groups dwelling in the same oasis this would always have been a temporary one, hardly formalised in a way to make it visible across the archaeological record, as would be expected if one considers the ostentation displayed in the collective burials. We should consider the oases of third millennium BC



Figure 259:
A tentative design of the representations on the Hasat bin Salt (Italian Archaeological Mission to Oman).

Oman as places where cooperation was organised around alliances among leading families and their affiliate clans and where conflicts were mostly solved by negotiation or appeal to the moral authority of a commonly accepted person rather than by the compulsory power of a central institution. In other words, nothing like those written codes of law, juridical bodies, and permanent armies existing at that time in Mesopotamia was present in Magan. From the organisation of an "alliance" system, we may even assume that if "towers" were not all integrated into a larger entity at oasis level, they could, on the other hand, have been associated with similar groups in oases and settlements across the country, as in tribal territoriality of historical Arabia. The solidarity of groups living in the same oasis, necessary to keep it working as their vital common resource even during internal conflict, and loyalties to related groups on other sites, would have made local policies an intricate structure webbed by matrimonial, economic, and social relations.

A proud statement by Naram Sin, the Akkadian ruler of Mesopotamia who raided Oman in the 23rd millennium BC, mentions that he defeated Mannium, King of Magan (the name is unfortunately broken in the text and other readings are possible, like Mannu Danu). This does not prove that Magan itself was a kingdom in the hierarchical sense. Apart the fact that the Mesopotamians projected onto others their own political categories, a powerful king like Naram Sin could only defeat other powerful kings! We may suppose that, if he ever existed, Mannium was the temporary leader of a coalition of tribes, appointed as equal among equals to coalesce the forces against the invaders. This agrees with the status of King as expressed in the earliest historical records of Southern Arabia. Karib il-Watar, head of the kingdom of Marib, who unified Yemen under his rule at the beginning of the seventh century BC, took for himself as his first title that of *Mukarrib*, "the one who federates", although from his own accounts of this process one understands that it was made at



Figure 260 – Hasat bin Salt at the foot of the impressive Jebel Al-Abri (photo Joint Hadd Project).

the cost of extremely violent military campaigns against other kingdoms and local tribes.

In such societies, one would expect that large ceremonial centres would exist, where various related groups would periodically meet to renegotiate and legitimize the alliances with elaborated ritual performances. In Yemen, for instance, these centres have been recognised for earlier periods in the shape of alignments of large standing stones, notably at Al-Mahandad in the Tihamah. Others are known in western Saudi Arabia, like Rajajil, dating from the fourth millennium BC. A more familiar comparison for European readers would be Stonehenge in southern England or Carnac in Brittany. Such meetings, however, can take place anywhere and do not need the establishment of permanent structures that easily catch the attention of archaeologists: think, for example, of what would be left by a traditional Omani wedding party. One disappointing aspect of Omani archaeology is that, with the salient exception of graves, we have at present, contrary to findings in other regions in the Near and Middle East, very few indications of religion and rituality. Of humble clay figurines for private use or large temples of collective significance, so common in other civilisations of the Middle East, none has ever been found here. It may be, as suggested by several specialists, that some isolated and still unexcavated buildings tentatively dated to the third millennium BC, were in fact temples - for example, a large rectangular building at al-Hind, south of the oasis of Al-Khashbah (fig. 262), or another at Araqi east of Ibri, or a large oval building with three concentric walls at Khutm west of Bat. These structures are made of large masonry blocks similar to those of the towers and represent huge examples of collective work; but their function cannot be investigated without excavation.



Figure 261 – An engraved facing stone from an Umm an-Nar tomb of the late 3rd millennium BC, recently discovered at Adam. It represents two humans, a common theme in Early Bronze Age Oman. The one on the right wears a dress (a woman?) while the other on the left appears naked. The association of two males is known from grave 1059 at Hili and on the square stamp seal from Ra's Al-Jinz, while the association between a human wearing a dress and another almost naked (or wearing a simple loincloth) is known from the probably contemporary Hasat Bint Salt rock carvings. The interpretation of such representations obviously remains a challenge for Omani archaeology (photo Ministry of Heritage and Culture).

At present, our only hints about ideology at a collective level come from engravings on tomb 1051 at Hili, where, apart from the "alliance" scene on the southern door, three other groups are represented on the northern door: a human riding a donkey near a standing figure carrying a spear, two humans embracing, and two leopards or cheetahs eating a gazelle (fig. 257). Standing animals (a camel, an ibex) are also represented on an almost contemporary tomb at Umm an-Nar. Apart from enhancing the role played by wild animals in these obviously ideologically significant representations, little can be said about their meaning. Another such engraved stone was also found in the settlement at Umm an-Nar. It represents a man in the same style as those of Hili and was discovered in the same room as two limestone blocks in the shape of an open chest that may suggest a religious function, although this remains to be confirmed. If its function was religious, it would be the only evidence of a possible "domestic" or "communal" sanctuary in Oman's Early Bronze Age.

Another curiosity of Omani archaeology, the Hasat bin Salt near Al-Hamra, also known as

Coleman's Rock, may have played an important role within a ceremonial place. This huge squarish limestone boulder, presently located in the middle of a large wadi bed, is engraved on two of its roughly vertical sides with full-faced and broad-shouldered beardless human figures, life-sized or slightly larger. On the southern face are four aligned figures (fig. 258). At the centre stand a man and woman, both heavy-shouldered. With both hands raised, the man wears a loincloth attached to a belt. He holds a mace in his right hand. The woman is wearing a crescentic headdress and what looks like a long robe. Her arms hang close to her body. Two smaller figures, possibly a male and a female, are on each side of this couple at the centre. Three more figures in the same style are depicted on the western side of the rock. All these figures have been carved using an extremely time-consuming pecking technique that eventually produced a kind of bas-relief. The process required hundreds of hours from several people working on scaffolding, a task that would not have been undertaken by a few shepherds in their leisure time (fig. 259). And, despite more than four thousand years of exposure to erosion, the figures retain a certain monumentality that still conveys symbolic power. Dating rock-art is always a questionable enterprise, but, given the evident engraving similarities at the Hasat bin Salt and at Hili, or the "alliance seal" at Ra's Al-Jinz, and some figurations in the art of Iran and Baluchistan from the same period, most archaeologists would accept a date in the third millennium BC. The rock is itself located at the foot of a huge vertical outcrop, Jabal al-Abri, that may also have played a role in the location of such a ceremonial centre (fig.260). Mountains in pre-Islamic Arabia are often considered as sacred places and become the object of particular worship. Several such cases are known, for instance, in the South Arabic civilisation of Yemen. A temple was often built at the foot of such mountains; but it was not necessary and rituals could be performed in the open air. If any feature of that kind ever existed, perma-



Figure 262 – This very large stone building at Al-Khashbah is the only one that can be considered at present as different from the common towers in the Early Bronze Age oases. However, the dating still needs to be confirmed by excavations (photo Jürgen Christian Meyer).



Figure 263 - Ra's Al-Jinz RJ-2: two small stamp seals with three engraved signs identified as writing, the first known in Arabia, found in building VII. The double concentric circle on the right one is not a sign but part of the decoration of the stone vessel on which the seal was carved, ca. 2200 BC (photo Joint Hadd Project).

nent or temporary, its traces would long since have been washed away by the powerful floods of the wadi.

Experimenting with Writing.

Two small discoveries at Ra's Al-Jinz tell us more than any other archaeological find or textual reference about the level of complexity reached by the Land of Magan in the late third millennium BC. Together with the incense burner, they come from the northern compound of houses and date from around 2200 BC, about the time of Naram Sin's campaign. They are two small stamp seals, one oval and the other squarish, carved in the upper part of a broken steatite hemispherical bowl (fig. 263). Each bears on one side three signs. Two are present on both stamp seals, one made of two parallel strokes and the other resembling the letter "h" of the Latin alphabet. In addition, one seal bears an open rectangle with a long slightly concave side and the other a disk or plain circle. These signs, studied in co-operation with specialists on ancient Arabian epigraphy, can safely be recognized as a form of writing.

The fact that the seals were made by re-using two fragments of local soapstone vessels leaves no doubt that they were made in Oman, and not with special skill or care since whoever carved them made no effort to abrade the early decoration of concentric circles from the sherds. The signs were made as something usual, as if the writing was nothing exceptional, even in this peripheral village of seasonal fishermen. In fact, the person who made them did not expect that more than four thousand years later these two tiny seals, the work of an hour at most, would become the very first proof that in his time a form of writing had become indigenous to Eastern Arabia. Earlier inscriptions dating from around 2400 BC have been found at Ra's Al-Jinz, but they are evidently imports from the Indus valley, written on jars or stamp seals. This is not the case with the two 3-sign combinations on the chlorite



Figure 264 – Gulf type stamp seals with Indus script characters and a bovid in Indus valley style, dated to the very end of the 3rd millennium BC. n.1 and 2 were found at Ur in southern Iraq; n.3 and 4 were found in Bahrain. They may attest to a local use of the Indus script by that time (document after various sources).

seals: they show no parallels with Harappan writing but plenty with that of South Arabia, despite the fact that more than a millennium separates them from the presently accepted date of the development of this script, around 1000 BC. These signs also have close similarities with those of proto-Elamite and linear Elamite systems of writing that developed across Iran around 3000 BC and in the last centuries of the third millennium BC. This might better explain their origin, considering that administrative requirements would certainly have arisen in Oman with the growth of economic and political complexity during the same period. The use of sealing and writing was already known in Magan by 2500 BC, both from Mesopotamia and the Indus. It came with foreign items like the imprint of a Syrian-style seal found on a jar at Umm an-Nar, a copper stamp seal bearing Indus script found in the southern compound at Ra's Al-Jinz, and various short inscriptions scratched on the shoulder of black-slipped Indus transport jars found all over the country from Umm an-Nar to Ra's Al-Jinz. A single cuneiform sign may even be tentatively identified on the sherd of a Mesopotamian jar that reached Ra's Al-Jinz as a container for bitumen.

Around 2300 BC, the use of stamp seals spreads in the Gulf countries. In the Upper Gulf and Bahrain, the Land of Dilmun in the Mesopotamian texts, it develops into a particular and very standardised type of round button-like version, the so-called "Persian Gulf seals", that sometimes also bear a short inscription in Indus script characters (fig. 264). In Oman, seals appear at the same time. Stamp seals of various shapes are presently known from al-Abraq and Kalba in the UAE and from Bisya, Al-Moyassar, and the Ja'lan (at Ra's Al-Hadd HD-1 and HD-5,

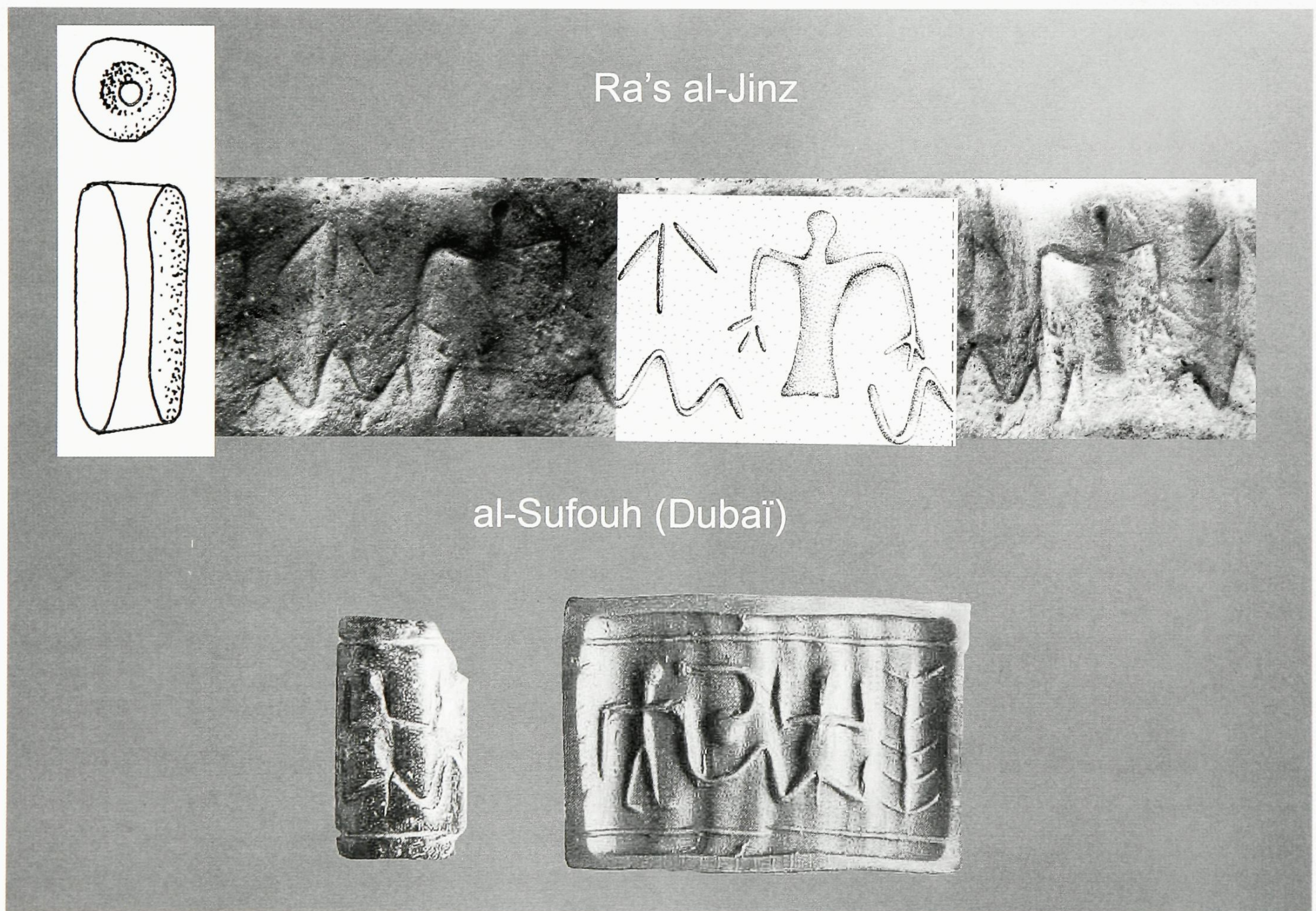


Figure 265 – The only two cylinder-seals known from the Oman peninsula seen above are carved with rather similar representations. The one from Ra's Al-Jinz is badly worn and its interpretation is difficult. It was found outside Building II in the layers of period II. The second one from al-Sufouh was found in a grave. Both can be dated to around 2400 BC. (photo and drawing Joint Hadd Project and Jody Benton, 1996).

Ra's Al-Jinz RJ-1, and RJ-2, Aseelah ASL-1) in Oman (fig. 265). At Al-Abraq, the two specimens found may be considered as imitations of Dilmun-style seals. At Al-Moyassar was found a prismatic three-sided seal with engraved animals that probably derived from the Indus (fig. 273), and a small conical stamp seal made of lead with a very schematic human representation. At Kalba and in the Ja'alan we are mainly dealing with small round or square seals of soapstone, with the exception of the "alliance" seal at Ra's Al-Jinz and a similar blank seal found in a contemporary Umm an-Nar grave at Hili. Three of these small square seals are made of copper. On the whole, it appears that, unlike Dilmun, the Land of Magan did not develop its own style but borrowed from the surrounding countries. This development of seals would be related to the intensification of trade and to increasing attempts to establish institutionalised control over it, although none of these achieved a unified system. Writing developed accordingly. Many attempts were probably made by adopting and simplifying foreign writing (Elamite or Harappan) for local purposes, and we may not deduce from the presence of the characters that the language on the seals was itself Elamite or Harappan. We do not know this language, but the cuneiform texts of Mesopotamia reveal for us the names of three people of Magan. These are Mannium, already quoted as defeated by King Naram Sin of Akkad, Na-du-be-li, a kind of king or prince of Magan, and We-du-um, the messenger he sends to Amar Suen, Sumerian king of Ur in the 21st century BC. These three names are west Semitic and we may suggest that the language recorded on the stamp seals was in fact a west Semitic language, like the South Arabic languages written more than a millennium later in Yemen. Given the similarities between the Ra's Al-Jinz signs and those of the South Arabic script, this may lead to some extremely exciting developments when studying the populations of the Arabian peninsula, but the evidence at the moment is obviously too scarce for us to go beyond mere conjecture. Suffice it to say that we are now certain that the Magan people were using some form of writing for practical purposes by the end of the third millennium BC. This is already a major breakthrough in our knowledge of them and of the achievements of their society.

In this reconstruction of what should be called the Ancient Civilisation of Magan, we have used much data from the Ja'alan, though we should remember that it was a rather marginal area as far as international trade and the local society are concerned. The main centres were probably located around the towers of major oases in the interior, mostly south of the Jabal Al-Akhdar. A large part of the wealth produced by local and international exchange systems would have been concentrated there, so too the most powerful families. The whole story has still to be recovered from major sites and monuments that have yet been scarcely touched by archaeological research. This is both a frustrating situation and an encouraging prospect for the archaeology of Oman. The best results still lie ahead of us. ❑

Window 8.1
Al-Ayn: a Small Settlement and Palm Tree Garden in Eastern Oman
By Olivier Blin

Five families live today in the oasis of Al-Ayn, located 30 km south-west of Ra's Al-Jinz near the piedmont of Jebel Khamis. Sixty houses, scattered over a large and long alluvial terrace bounded to the south by a wadi, maintain small enclosed gardens of palm trees, edible plants, and fodder, as well as pens for domestic animals, mainly goats. They enjoy a quiet life.

An archaeological survey was carried out by the Joint Hadd project in 2004, revealing over 100 Hafit type cairn burials on the surrounding hills and high terraces. On the lowest terrace other structures were recognized, including Umm An-Nar type burials, but also small mounds and traces of stone walls. Sondages were dug on two of them (ALA-1 and ALA-2), near the mosque of the village, and yielded the remains of domestic buildings. The discovery of copper, flint, and shells suggests ancient occupation.

Site ALA-2 was selected as a test for understanding the characteristics of such settlements. Two programmes of excavation uncovered the remains of an almost square building, ca. 12 metres inside, built over the ruins of an earlier one (fig. 266).

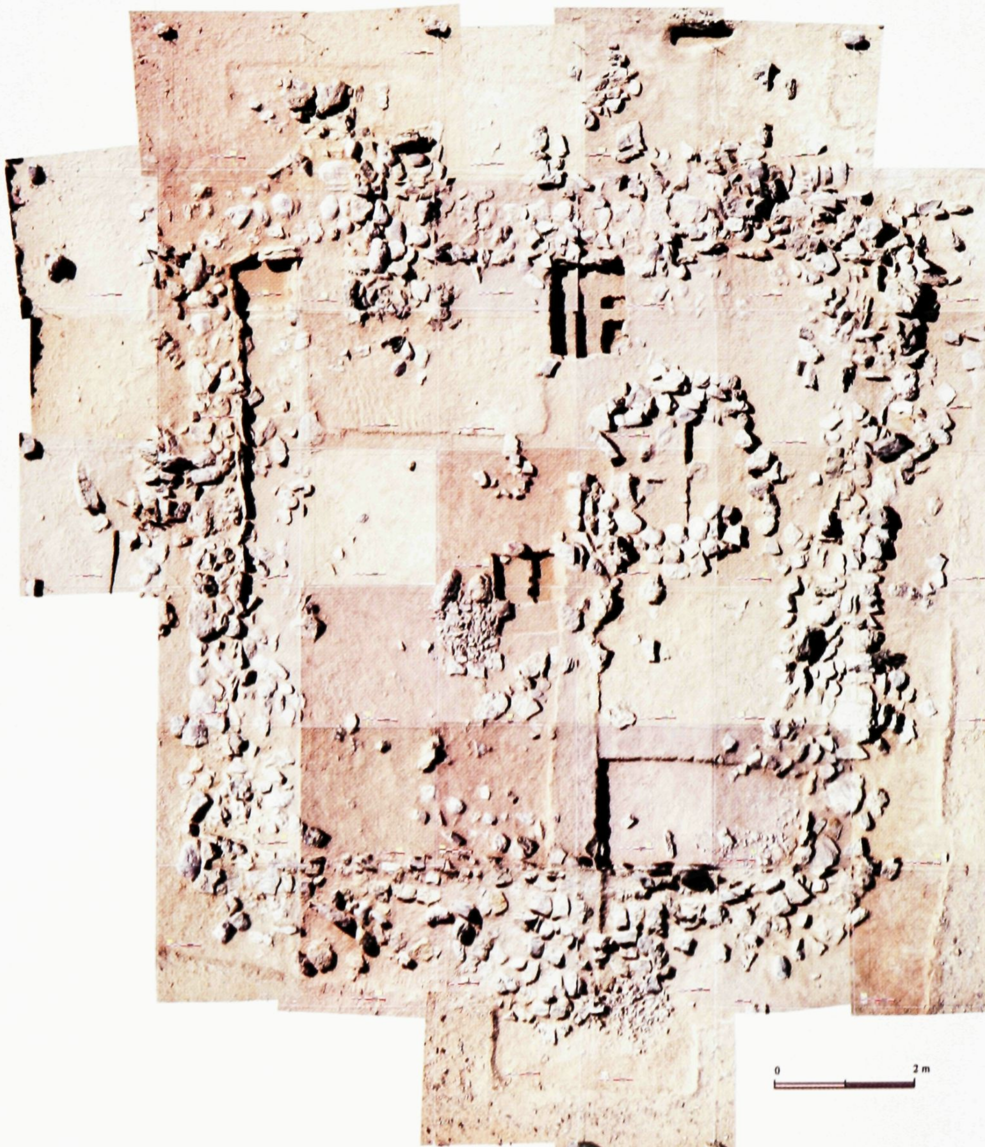


Figure 266 – A vertical view of the "house" at site ALA-2 in Al-Ayn, showing the two stages of its construction (Joint Hadd Project / Olivier Blin).



Figure 267 – The "house" at ALA-2 in Al-Ayn under excavation (photo Joint Hadd Project).

The walls, 0.70 metres wide, rested on a base made with large pebbles removed from the wadi bed and directly laid on the ground surface, apparently without preparation work. The first course was made with squarish blocks and all along the internal side flat slabs were placed in a vertical setting. All the building materials were found nearby, in the wadi bed or on the edge of the terrace. The elevation of the walls was probably made with mud-bricks (fig. 267).

A hearth stood at the centre of the inner space, near a round stone structure located in the north-west corner. This structure was two meters in diameter and built in the same way as the rest of the building, except the orthostats. Apart from this, no internal divisions were recognized, but the presence of three post-holes allowed one to hypothesize a light roof on at least part of the enclosed space. Outside the building, along its eastern and western sides, two other hearths made of small selected pebbles were found.

Various soundings were dug in and outside the building, uncovering a 0.40 metres stratigraphy with two main levels of occupation. The upper one was related to the second building; the lower one was directly in contact with the original surface of the terrace and belonged to the first building (fig. 268).

Very few items were found at Al-Ayn in comparison with other sites, especially on the coast. They included flints and shells (Conus, Anadara, Engina mendicaria), often used as beads, and small discoid shell beads. At the earliest level, several fragments of a reddish coated pottery were found that can be dated to the 3rd millennium BC.

A subsistence economy was suggested by land mammal bones still to be identified and two charred date stones, confirming that the aera was an oasis. At present the gardens of Al-Ayn are watered by wells excavated in each of them directly in the wadi bed where the underground water flow is ca. one metre deep. Garden location can easily change according to this level. There is also a falaj coming from a spring still used in the piedmonts of the nearby moutains that provides a perennial water supply. Could there have been a similar situation such a long time ago? This raises the question of seasonal or permanent settlement in ancient oases. Today the people stay throughout the year in their houses, which, increasingly, are rebuilt with cement bricks, a sign of progressive continuity. Domestic water comes in small blue trucks from desalination plants on the coast, and thus wadi water is less and less necessary. Recent construction of mosques is another sign of this evolution.

Further excavations are needed. However, Al-Ayn is very important as it represents a class of sites that archaeologists had ignored until recently – that is, a situation in which groups of several families were scattered over a large area using a restricted but reliable water resource. Some 12-15 structures similar to ALA-2 have been plotted on the edge of the terrace. Small gardens and herds grazing nearby were the basis for daily subsistence, and there was none of those high towers that have attracted archaeologists to the large centres of the interior. This probably represents the way of life of a large fraction of the people of Magan during the third millennium BC. ❑

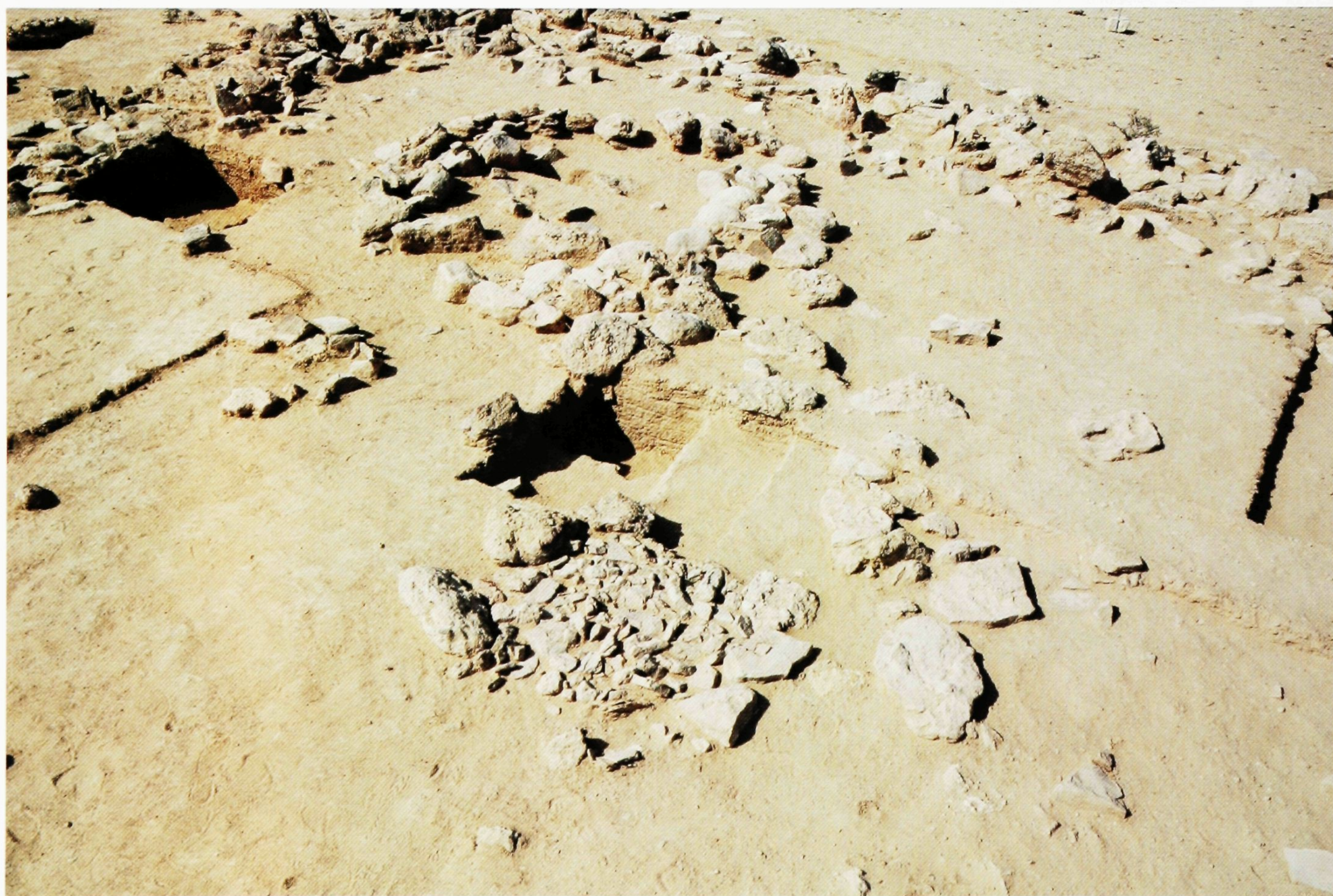


Figure 268 – Small internal structure and hearth (in foreground) at site ALA-2 (photo Joint Hadd Project.

Window 8.2
Copper Production as seen from Al-Moyassar-1
By Gerd Weisgerber

The Bronze Age settlement of Al-Moyassar lies in Wadi Samad, south of the oasis village of Al-Moyassar-1 on the western flanks of Jebel Al-Akhdar. From the amount of slag which has survived there, and from the remains of furnaces and the unusual mass of waste copper found, we may assume that most of the metal produced was meant to be traded away from the site.

The smelting village is located about 1 km south of present-day Al-Moyassar on a low terrace astride the different branches of Wadi Samad. Its gullies remain dry for nearly the entire year but, following rainstorms in the nearby mountains, floods pour down into the desert. Huge amounts of water, which have completely covered the surface of the settlement site over the millennia, bear witness to the possible demise of the original village and its inhabitants. Thus only traces of the original mud-brick constructions exist today (fig. 269).



Figure 270 – A copper hoard comprising 22 bun-shaped ingots or fragments of bun-shaped ingots in a house at Al-Moyassar-1 (photo German Mining Museum at Bochum).



Figure 269 – Al-Moyassar-1, house 6 under excavation (photo German Mining Museum at Bochum).

Several houses and a large walled courtyard along a street were excavated by the German Mining Museum of Bochum. Although the preserved settlement remains extend over 200 x 70 m, in the Early Bronze Age the settlement was far larger. The surface of the site was strewn with fist-sized stones, pieces of slag, furnace fragments, and pottery sherds. Occasional hand-sized cubic pounding stones were also found.

Excavation showed that the settlement experienced two main phases of building around the end of the 3rd millennium BC. The same kind of pottery occurs in both phases, but stone house foundations occurred only in the second phase, usually separated from the first level by a sterile layer of silt. The first phase consisted of innumerable hearths, large and small, which were built on the original gravel sur-

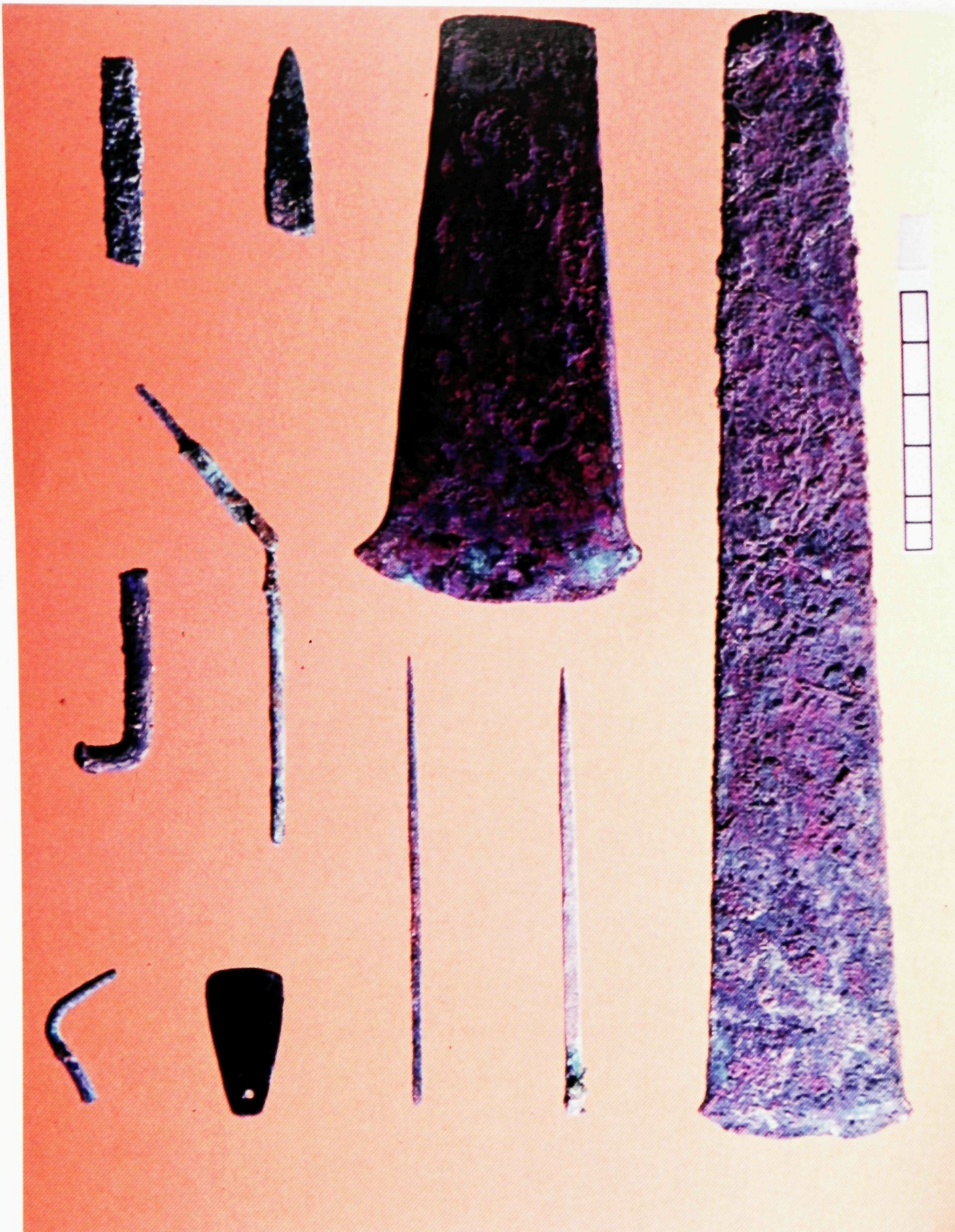


Figure 271:
A set of copper tools found at Al-Moyassar (photo German Mining Museum at Bochum).

face. Remains of buildings could not be attributed to this phase, with the exception of the base for a smelting furnace. Most of the furnace fragments and slag found in the second phase, used in the filling of the stone walls that form the base of the houses, derived in fact from this earlier phase.

Different types of buildings occurred. Simple houses had a single room in the corner of a partly walled-in rectangular yard. But one house had four rooms of nearly the same size. Inside one stood a large anvil stone surrounded by several hearths. In a small cylindrical pit beside the anvil a nearly spherical pounding stone of handy size lay ready for use. Doubtless here was a smithy. An industrial section with pounding stones and small scraps of copper in another house bear witness to a metallurgical workshop.

A large rectangular courtyard of some 18 x 24 metres enclosed by walls one metre thick was particularly well equipped. A covered canal several metres long led to a cistern one metre wide at its centre. Two circular ovens for baking, similar to the modern tannur, were sunk into the ground. Beside the presumed entrance, just beneath the surface, the project's most important metallurgical find came to light. Surrounded by several small hearths lay a hoard of copper ingots, corroded together, including one complete and 22 fragments of low hemispheri-

cal specimens, weighing in total 6 kg (fig. 270). This hoard showed in what form the manufactured copper was traded. Furthermore it turned out that in phase II of the settlement, when copper was no longer produced, it was nevertheless still actively used and traded. The ingots were formed simply by pouring molten metal into shallow holes in the ground, as encountered in several cases beside the hearths. The number of amorphous copper fragments, droplets, prills, ingots, or fragments of ingots scattered across the settlement at Al-Moyassar-1 was truly remarkable. It exceeded by far the number of manufactured objects such as pins, awls, or axes. It also exceeded the total number of such copper ingots known outside Oman, except for a new ingot hoard in Bahrain - made of Omani copper! (fig. 271)

From more than one cubic metre of furnace fragments found at Al-Moyassar-1 a small pear-shaped furnace tapering to the top could be reconstructed. The diameter at the bottom was some 40 cm, narrowing to 15 cm at the upper flue, while the total height measured about 60 cm. Circular holes in the lower wall served for ventilation. We assume that artificial forced draught was used to achieve and sustain higher temperatures in this type of furnace. Copper ore was smelted by means of charcoal that would have been sourced from the numerous acacia, prosopis, and tamarisk trees in the area.

The ore deposit was located one kilometre to the west, in a neighbouring valley where the small entrances of mines can still be observed. Owing to the medieval reopening of the mines none of the Bronze Age structures survived. Houses, mines, and dumps from Islamic times probably cover the ancient traces.

Al-Moyassar-1 was not a Bronze Age industrial centre monopolised by copper production. Especially in the north of the settlement, craftsmen's quarters were located. Here, beside a small round pottery kiln with a small firing chamber, there was evidence for the production of soapstone vessels. Raw materials, unfinished soapstone artefacts, and a bronze "engraving iron" confirm this production. Such vessels were another important item of trade and were sent everywhere in the Gulf, to Mesopotamia, and even to the Indus. But nevertheless copper production remained the main industrial activity.

The economy of the local population, however, turned primarily on agriculture and food production. The entire plain between the two arms of the wadi - an area of more than one square kilometre – was used for growing crops. In aerial photos taken west of the ruins a network of irrigated gardens is clearly visible. To hinder the erosion of the silt, and to retain as much moisture as possible, the farmers erected a boulder dam several hundred metres long across the lower terrace. Over the years the land above the dam rose in height owing to alluvial deposits. This soil-saving technique, known in Baluchistan as "garbaband", was the main method of water and soil management in the gravel piedmonts of the hilly areas, from eastern Iran to northern India. In Oman, beyond the dam of Al-Moyassar, there is evidence of retaining walls in other oases of the interior such as at Kashbah and Al-Aqir near Bahla.

Like other early Bronze Age oases, Al-Moyassar-1 had a large fortified round tower (fig. 147). Built of stones, and twenty metres in diameter, it still stands about six metres high. Like others, it had a



Figure 272 – A copper tool found at al-Aqir, together with several similar objects. There is a striking similarity in shape and manufacture to an object found at Ra's Al-Jinz RJ-2 (fig. 237). We consider them as tools although other archaeologists, impressed by their stylized anthropomorphic aspect, would tend to interpret them as idols, an interpretation that cannot be ruled out (photo German Mining Museum at Bochum).



Figure 273 - A three-sided prismatic seal found at Al-Moyassar. Such seals are rather common in the Indus valley. Besides a scorpion, quadruped, goats and wild goat, a Zebu also occurs. Although the theme is reminiscent of the Indus style, a local origin in imitation of the Indus style cannot be ruled out (photo German Mining Museum at Bochum).

well in the centre, some fifteen metres deep. It is still difficult to establish the extent to which these towers were "houses" for people to regularly live in. Probably they were also watchtowers and places for refuge in case of danger. They are large enough to accommodate many people with their animals.

Of course building towers, organizing mining, smelting, and trading copper needed competent leaders; and the resulting expansion of the economy finally produced a new elite. The complex economic structure of Bronze Age Al-Moyassar shows that it was more than a settlement in the hinterland. The idea of supra-regional contacts is supported by the discovery of a three-sided prism seal, whose thematic decoration consisted of a scorpion, quadrupeds such as goats, a wild goat, and a zebu. This was entirely unexpected (fig. 273). The zebu is characteristic of the cultures of the Indian subcontinent. Pottery finds clearly suggest this direction of trade, in which Omani copper obviously played a key role. Magan in turn became dependent on these contacts with the subcontinent. When, because of a competitor with a superior technology that led to cheaper production, Magan lost its market, the country went through a deep political crisis. A similar condition was exacerbated when the Indian partner also suspended commercial ties because of its own internal political, social, and cultural decline.

A cuneiform tablet from Mesopotamia illustrates the situation. Written in 1744 BC it was the last to mention indirectly the copper trade with Magan. We may imagine frenzied activity in the harbour, this time in Babylon, under the rule of King Samsuiluna (1749-1712 BC), son of Hamurabi, in his 5th year. A merchantman was ready to sail to Dilmun to bring "... 12 minas of purified copper from Alashia and Dilmun" (1 mina = 0,5 kg). For centuries copper from Dilmun/Bahrain meant copper from Magan/Oman. This is the last hint of foreign demand for copper from Magan. And at this time we first hear of Alashia/Cyprus, which would be the new source of the metal. The copper wealth of Cyprus was based on large ore deposits, but of sulphide copper ore. From these deposits metallic copper can only be smelted by a difficult process involving several steps. This technique became known only after c.1700 BC at which time a complicated smelting process of chalcopyrite, which could effectively produce cheap copper from Alashia/Cyprus in unlimited amounts, took over the market during the Mediterranean Bronze Age until about 1200 BC. With the end of foreign demand for Omani copper, the metal was mined only for local use. ❑

Chapter 9

Collapse and Transformations: the Wadi Suq Period

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Collapse and Transformations: the Wadi Suq Period

Around 2000 BC, in the space of only a few generations, the people of Oman experienced dramatic changes. These are identified by archaeologists through a new cultural "assemblage", a collection of objects differing from those found at the third millennium BC sites. It is called the Wadi Suq culture, after the place west of Sohar where its first elements were found in 1972 during an archaeological reconnaissance by a Danish team led by Karen Frifelt, following her pioneering excavation at Hili in the United Arab Emirates. Here she uncovered a graveyard of single burials containing a new type of pottery that she rightly dated to the beginning of the second millennium BC on the basis of comparisons with Iran. Similar objects were later found in another graveyard at Wadi Sunaysl near Ibri and then recognised in collections of material already excavated from several sites, notably at Hili and Bat, where they did not seem to belong to any particular new monument. Rather, they appeared to represent a kind of squatter occupation among the ruins of previous towers. For many years this period remained enigmatic, associated only with new types of pottery, chlorite vessels, and metal objects. As often happens in archaeology, the Wadi Suq period came to be seen as a "Dark Age", combining an apparent impoverishment of material culture with a deep economic and political crisis, abandonment of sedentary life, and depopulation. Destabilisation from outside, and notably the collapse of late third millennium BC trade networks, were often thought to explain this new cultural configuration. Oases were supposed to have been abandoned and replaced by a more nomadic way of life, made possible by the development of camel domestication. The objects found were assumed to fill the gap of almost a millennium, between the "fall" of the Early Bronze Age civilization and the "rise" of the Iron Age cultures, whose mud-brick settlements were already known by archaeologists, around the beginning of the first millennium BC. It was even unclear if the new cultural assemblage covered the whole second millennium or only its first centuries, before the region became completely depopulated. This situation is to some extent a measure of the surprise felt by archaeologists after the discovery of the third millennium BC oases. In a country that had for long been considered empty, or only occupied by erratic bands of poor foragers, they appeared at best as an accident, if not an aberration. When he was able to date to the third millennium BC his first discoveries at Umm an-Nar, the Danish archaeologist Geoffrey Bibby did not hesitate to write that the site had been "a short-lived settlement of colonists from the Persian coast opposite, who had come and a generation or so later gone without having had any contact at all with the indigenous people of the interior; if indeed there had been any people in the interior until a thousand years later". He considered its existence as geared to a different climate, in particular to a greater rainfall than nowadays, and there is no doubt that he was followed in this thinking by most of his colleagues working in the Middle East. Indeed they would have been reluctant to admit the contrary. Now that, thanks to his own work and that of his Danish colleagues, the image of the Early Bronze Age culture of Oman is well accepted, and the Wadi Suq culture itself is better known, more accurate explanations must be sought.

New Settlement Types

Archaeological sites belonging to the Wadi Suq culture have now been located all over the Oman peninsula, from Musandam to the island of Masirah, where it is associated with the first dated Bronze Age occupation (fig. 274). First and most obvious is the replacement of ancient types of pottery, copper tools, and stone vessels by new ones, and the construction of new types of grave, among which single burials are found beside collective burials for the first time in more than a millennium. The evolution through time of some artefact categories, notably pottery, was established and we are now certain that at least some sites were settled throughout the sec-

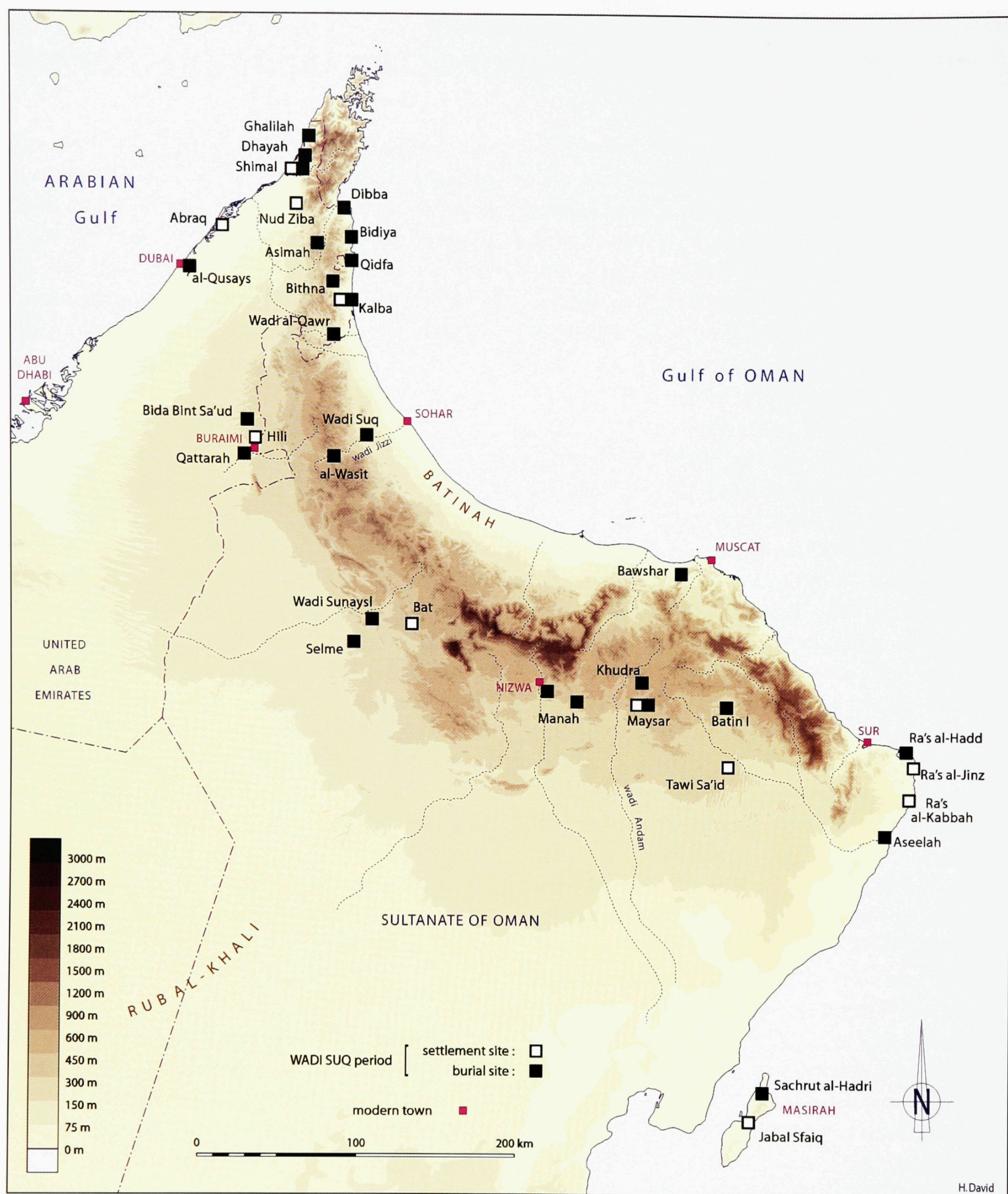


Figure 274- Main settlements and burial sites of the Wadi Suq period during the second millennium BC. Settlements are still distributed across the country with remarkable continuity from the preceding period. If we compare the rarefied distribution of Wadi Suq sites with the higher density of Early Bronze Age ones, it is evident that major changes have occurred in between. For this period, the map may not lie, indicating that the number of permanent settlements had decreased (drawing Hélène David).

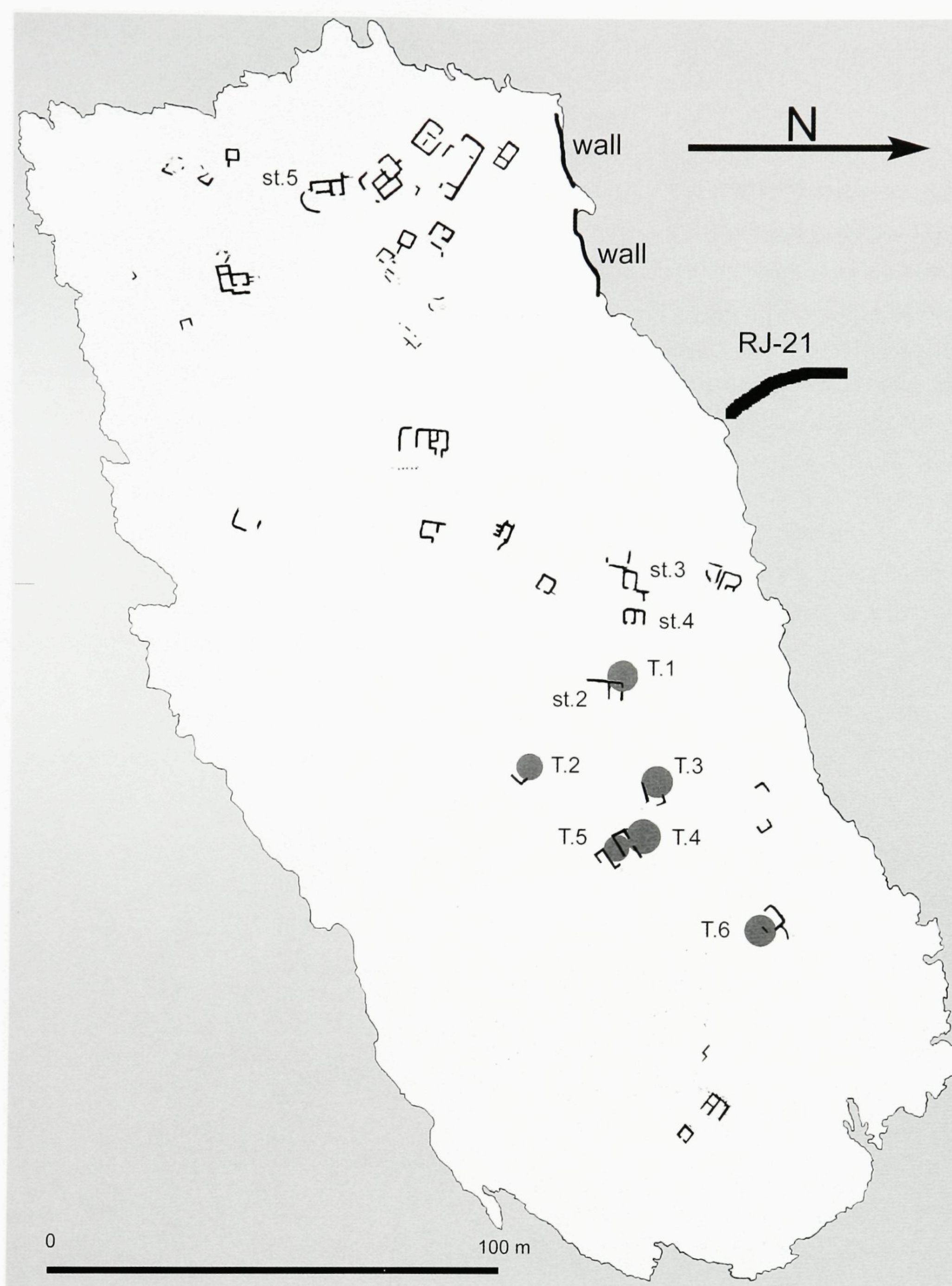


Figure 275:
Ra's Al-Jinz RJ-1: plan of Wadi Suq village, the only one known so far. Only structures 3, 4 and 5 have been excavated. The plan was established after kite photographs by Yves Guichard (Joint Hadd Project).

ond millennium BC, although the data to hand does not allow us to trace with the same precision as before the way of life and the occupation of the land. A few points can, however, be stressed.

Even if it should not be overemphasised, a population decline in the area seems real, as exemplified in the Ja'alan. Intensive surveys there have yielded only two small sites, at Ra's Al-Jinz (RJ-1) and near ad-Daffah (DHF-27), in marked contrast with the larger number of sites and graveyards of the third millennium BC. But we find at least traces of a Wadi Suq occupation almost everywhere in the ancient oasis settlements, at Shimal, Hili, Bat, and Al-Moyassar; and it even appears that important new buildings were constructed at sites like Al-Abraq and Kalba. Cemeteries are more obvious and they also have been found all over the country, located in almost the same places as before, and re-use of older graves, both of the Umm an-Nar and Hafit type, is rather frequent. Generally speaking, none of the environments already exploited seems abandoned, but a new type of territorial occupation and lifestyle, less visible to the archaeological gaze, replaces the old ones.

At Bat, the presence of a Wadi Suq occupation is confirmed only by a few fragments of pottery and stone vessels among the ruins of the stone tower, while at Al-Moyassar similar objects are found in the most recent layers of the houses which continued to be occupied or were re-occupied after a short period of abandonment. A handful of pottery sherds of the Wadi Suq type have been found on the surface of archaeological sites at Amlah, Bisyah, Wadi Far, and Wadi Andam, while at Tawi Said in the Sharqiyah the traces of unexcavated rectangular mud-brick buildings or terraces have been recognised from the surface in association with sherds of Wadi Suq pottery. At Hili, a few objects of the early Wadi Suq period were found in what appears to be a reconstruction of tower Hili 3 or the scanty remains of a new building constructed over its ruins, while at Hili 8 there is clear evidence that the tower was still standing and used. Its well was still in use and pottery sherds of the Wadi Suq type were found at the bottom of it, below a filling of stones fallen from the destruction of its upper part. Around the tower a surrounding enclosure was built, some eighty centimetres wide and made of mud-bricks over a stone base. This stone base itself seems characteristic of a new style of construction during the Wadi Suq period, comprising a filling of loose stones between two facings of standing slabs - a technique also found at Shimal in the Wadi Suq settlement as well as in some Wadi Suq collective graves at Qattarah and Shimal. East of the tower, the enclosure extends to delimit a large space some 25 meters in diameter. A series of rectangular rooms in mud-brick or light material was built against its inner face, while the open space appears to have been devoted to domestic activities. Segments of an enclosing wall associated with light material constructions have also been found at Shimal. At Al-Abraq, the standing remains of the older tower, still several metres high, were crowned by a two metres thick stone wall enclosing



Figure 276 – Ra's Al-Jinz RJ-21: Wadi Suq period shelters against the fortified wall closing access to RJ-1, ca. 2000-1700 BC (photo Joint Hadd Project).

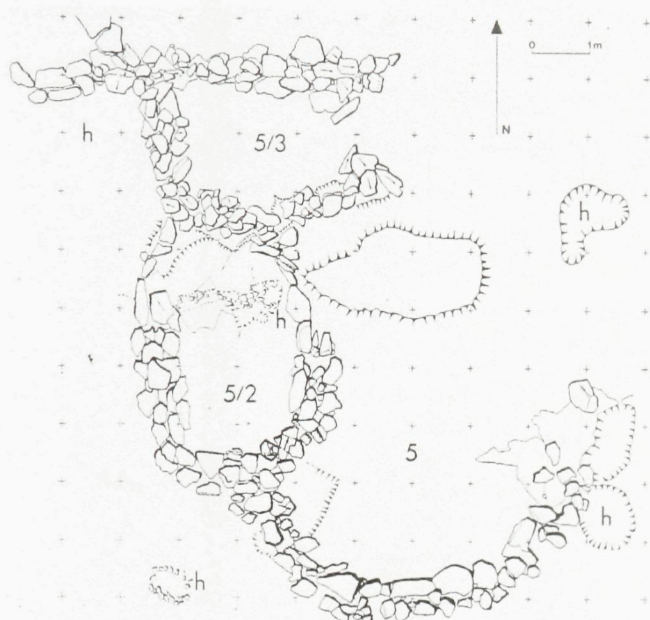


Figure 277 – Ra's Al-Jinz RJ-1: plan of structure 5, ca. 2000-1700 BC (Joint Hadd Project / Paolo Biagi).

Oman peninsula. Given that, as at Hili, the well of the old tower remained in use for the new constructions, we can assume a continuous use of the site; otherwise the well would have been quickly damaged beyond repair. Another enclosure, made of a four to five metres thick mud-brick wall and more than 45 meters in diameter, was also found at Kalba on the Indian Ocean coast and here again it seems to have been later covered by a mud-brick platform. Other Wadi Suq sites with structures of some importance have also been surveyed at Nud Ziba and Bida'a in the northern United Arab Emirates.

Apart from the presence of large buildings, excavations at Al-Abraq, Shimal, and Kalba have shown an evolution through time in the pottery that now allows us to date the Wadi Suq period between ca. 2000 and 1300 BC and to divide it at least into two phases. During the first, that would broadly cover the first half of the second millennium BC, painted



Figure 278: Ra's Al-Jinz RJ-1: Wadi Suq house structure 5 under excavation (Joint Hadd Project / Paolo Biagi).

an area ca. 30 metres in diameter. The space contained light structures of a *barasti* type, of which only the postholes were found, and a few centuries later the whole summit was covered by a huge platform of large mud-bricks, in places five metres thick, that would represent the largest construction of the second millennium BC known in the whole

pottery vessels are associated with a larger quantity of unpainted storage vessels. This corresponds with findings at the circular enclosures of Hili, Kalba, and Al-Abraq, or with the RJ-1 site at Ra's Al-Jinz. Later, during the third quarter of the second millennium BC, pottery paste becomes coarser and the vessels are left undecorated. Their shape is very sim-



Figure 279 - Shuwaymieh, Dhofar, this modern fishermen's shelter suggests what structure 5 at Ra's Al-Jinz RJ-1 may have looked like (photo Joint Hadd Project).

ple and, as a result, such objects can easily be missed or impossible to recognise when reduced to sherds lying on the surface of an archaeological site. This may be why this period, which broadly corresponds to the mud-brick platforms at al-Abraq and Kalba, was often not recognised in archaeological prospections.

Site RJ-1 at Ra's Al-Jinz in the Ja'alan is another important source of knowledge about this period. Located on the central mesa overlooking the sea at Ra's Al-Jinz, it was settled almost immediately after the abandonment of RJ-2, the Early Bronze Age site at the foot of the central mesa. The area itself had already been used by prehistoric fishermen since at least the end of the fourth millennium BC, as shown by the postholes of circular huts dug in the rock, and remained in use during the third millennium BC for various kinds of activities. It is in fact the only place at Ra's Al-Jinz where traces of settlement dating to the early third millennium BC were found, though they were very poorly preserved. But the most important period on the site is represented by the remains of some thirty houses, still visible from the surface (fig. 275), that can be dated to the first half of the second millennium BC. Unlike Hili, Kalba or Al-Abraq, no fortification was built around the new settlement. There was no need as the mesa's 20-30 meters high steep slopes, in many places with overhangs, were themselves an efficient protection. However, the only easy access to the site, a small gully on the northern side, directly opening over the site of RJ-2, had been fortified by a one meter thick stone wall, still standing more than two metres high (fig. 276), that left a passage to a narrow lane climbing from the plain. Excavations carried out by the Joint Hadd Project have hitherto left this important construction untouched, with only a small sounding against the inner side that uncovered some two metres of accumulated earth mixed with archaeological artefacts, including turtle and fish bones, flint tools, and characteristic painted pottery sherds of the Wadi Suq period. There is evidence that at times circular stone shelters were built against the wall and that humans had occupied all the small crevices and narrow flat areas on both sides of the gully inside the protected area. From there, a narrow track, still visible, provided access to the flat top of the mesa three-four meters above. At this point, and to the south, a narrow surrounding wall still stands on the edge of the mesa. In our opinion, this is more to prevent people, especially children, from falling from the cliff than a proper fortification.

The dwelling structures are concentrated near this wall on the north-western part of the mesa. Here they form a dense cluster with two rows separated by a kind of lane. On its discovery, the archaeologists were deeply impressed, penetrating for the first time a place that had been little visited since it was abandoned some 3500 years ago. The stone walls protruded through a deflation pavement of flints and burnt stones, slowly created by the heavy southern winds of the summer monsoon. It was decided to excavate as little as possible, partly in order to better understand the site as a whole but also to preserve for the future this unique discovery: an entire early second millennium village. Minimal excavation has partly revealed what could have been the life of an early second millennium BC fishing family. The houses, partly or wholly, were built of stone and comprised one or two small rectangular rooms, some two by three metres in area with a door on one of the small sides. We know at present of four houses. One consisted of a single room, with extensions on both sides that were apparently open; another consisted of two parallel rectangular rooms; and a third of two perpendicular rooms opening onto a small courtyard delimited by a semi-circular wall (fig. 277, 278). The fourth house had one and possi-

bly two small rectangular rooms and was built by re-using part of the setting and material of a destroyed Umm an-Nar tomb that had once housed the bones of the ancestors of the Early Bronze Age community at RJ-2. The remains of the circular outer wall had been used as a courtyard! All the doors broadly faced east towards the sunrise. We do not know how the houses were roofed, but we may imagine a flat roof made of small pieces of wood and brushwood, of a type that had frequently to be renewed, and probably each year when people returned for the fishing season. As we may imagine it at present after initial excavations (fig. 278), the RJ-1 village recalls the traditional fishing settlements along the Omani coast down to Dhofar, such as, for instance, the old village of Facharah near Shuwaymiyah (fig. 279). But the difference with the large house compounds made of mud-bricks of RJ-2, occupied only a century or so before, appears drastic. RJ-1 represents the beginning of a way of life and dwelling that continued over millennia along the Arabian Sea coast, and this abrupt change is a major signature for the arrival of this period.

Economically, the inhabitants of RJ-1 were still catching large fish and processing them. The huge amount of burnt stones on the surface and in the deposits is probably a result of the many fireplaces used for smoking. They still caught and butchered large sea turtles and occasionally dolphins and stranded whales, and they randomly consumed



Figure 280: Ra's Al-Jinz RJ-1, structure 3: a workshop of Conus sp. beads. This kind of storage of small Conus shells was found in all excavated structures of the Wadi Suq period at RJ-1 (photo Joint Hadd Project).

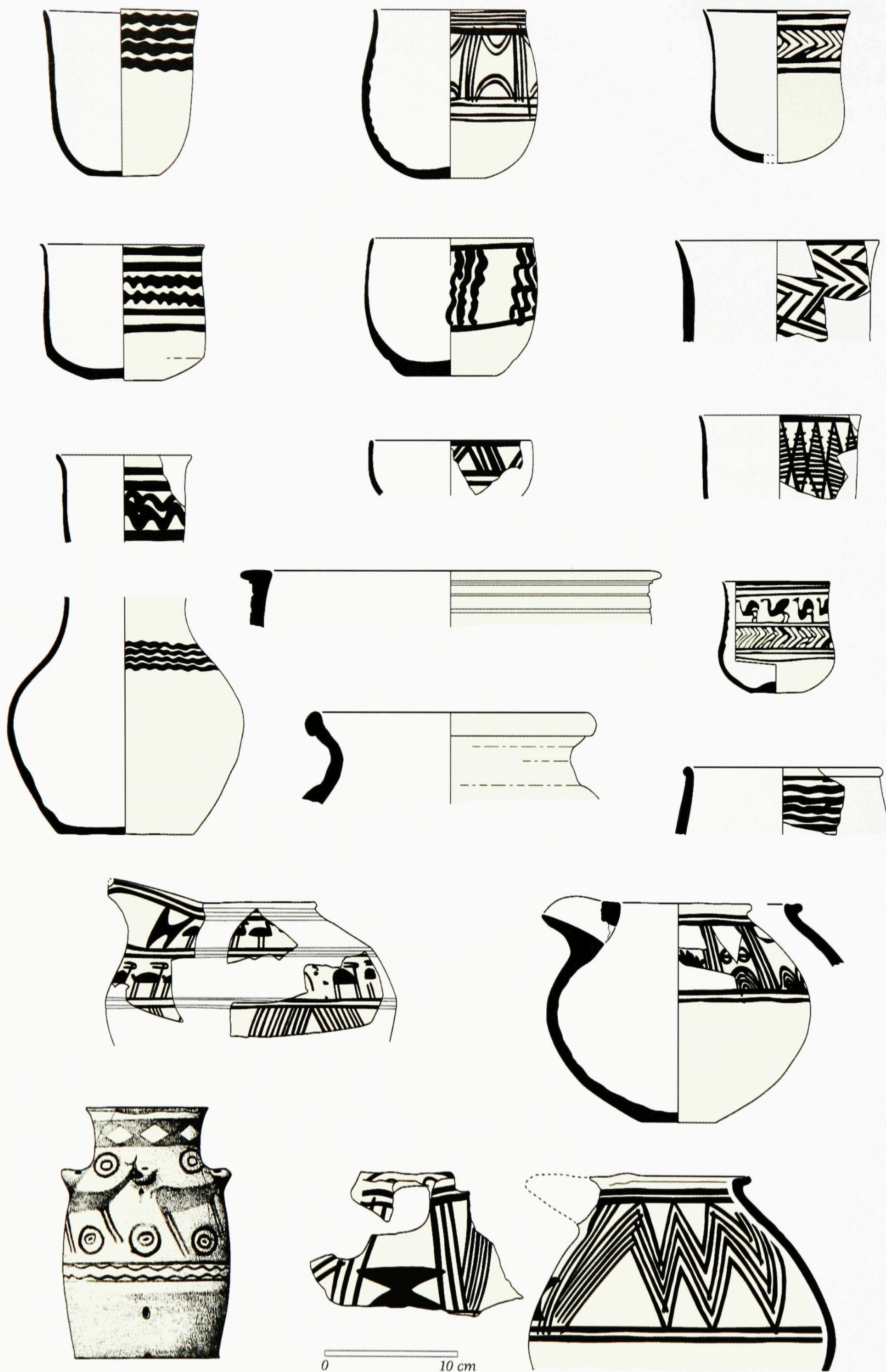


Figure 281:
Examples of Wadi Suq painted pottery, ca. 2000-1700 BC (Drawing by Hélène David)

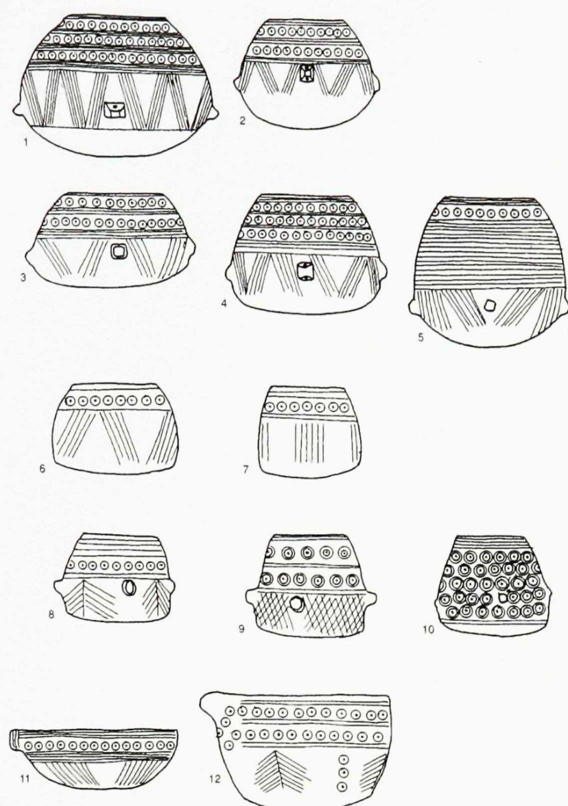


Figure 282 – Examples of Wadi Suq chlorite vessels.

shellfish, mainly mussels. A few bones of land mammals remain too, mostly of domesticated sheep and goats. Copper fishhooks were used of the same simple type as before, together with a variety of pins and needles. We may assume, however, that many other copper tools and weapons were available, although rarely found by archaeologists in the settlements: for example, a socketed spearhead of a type most characteristic of the Wadi Suq period was found in a secondary position, i.e. belonging to a later burial than the construction of the monument, in a Hafit type cairn at RJ-43 some two kilometres away from the site. Flint continued to be important for many daily activities. Among these remained the making of shell rings from the sawn apex of Conus shells, although these appeared to be smaller than before, made from juvenile shells, and constituting large beads for necklaces rather than proper rings. Similar beads were recovered in various Wadi Suq burials of the interior, as at Qattarah. Small heaps of 30-50 of these small shells have been found at places all around the houses and especially in the shelters near the isolated room, suggesting that they were collected and stored in bags of leather or perishable material. These shelters were certainly the working areas, as heavy flint blades and stone polishers used in the process are always found close to the shells (fig. 280). On the other hand, the making of rings from pearl oyster shells seems to have been abandoned. The use of pottery was apparently rather restricted and no storage jars, a frequent item of the Wadi Suq assemblages, have been found up to now. Soapstone vases were also present in very limited amounts. It must be added that human settlement at Ra's Al-Jinz during the Wadi Suq period was not restricted to RJ-1, as the stone-lined base of a shelter was uncovered at RJ-6 against an early third millennium Hafit type cairn grave that had been partly cannibalised for its construction. It is unclear if this was a proper house or a temporary shelter used by the people of RJ-1 themselves.

The Wadi Suq period is also the time when Masirah becomes included in the Bronze Age cultural sphere of northern Oman. We have already seen that many prehistoric fishing settlements existed there, and it is very probable that the island continued to be populated during the third millennium as well. But careful prospecting carried out by Ali al-Shanfari and Gerd Weisgerber for the Department of Excavations and Archaeological Studies could not find a single third millennium potsherd. By contrast, however, a dozen early second millennium sites with typical Wadi Suq pottery have been located all along the coast of the island. These include graves (see below) but also settlement sites in the shape of shell middens, the largest located near Sur Masirah, and at least two hillforts at Jebel Shabbah and Safaiq, probably related to the control and exploitation of copper mines.

Excavations must continue for a while if we wish to understand better the way of life at RJ-1. But there is already one very important point relevant for our understanding of what has happened by 2000 BC. People at RJ-1 probably still follow the same annual migration pattern as their ancestors of the Early Bronze Age one or two centuries earlier. But when at Ra's Al-Jinz they no longer dwell in large compounds housing extended families. This may be

a clear sign that deep social transformations had occurred.

New Objects of Daily Life.

One of the most immediately visible changes for archaeologists is the appearance of completely new types of pottery, stone vessels, and metal objects. The shapes and decorative patterns of the pottery vessels are entirely fresh (fig. 281). New types include large storage jars, cooking pots, bottles, spouted globular jars, etc. Together with this diversification of functional categories in domestic pottery, significant changes in the clays used may be related to a change in the location of workshops. Manufacturing techniques are also radically different. Coiling is now involved in making large storage jars, a class of vessels not produced before, and potters leave a conspicuous trace of string-cutting at the base of the vessel or scrap the bottom part of wheeled beakers and pots after partial drying. Some of the finer vessels, mainly bowls, beakers, and spouted jars, are still decorated with geometric patterns in black paint over a red slip, but these patterns are quite different from those of the late third millennium BC. A few vessels present a decoration of stylised animals, including caprines, and birds that archaeologists often identify as ostriches. This is not impossible, given that ostriches were probably still present in the area. However, the head of the bird represented on one vase of Al-Abraq is more evocative of a bustard, the bird most symbolic of Arabian desert hunting in historical times. The composition of fabrics is also very different. The clay can be mixed with a variety of tempers like coarse sand, crushed shells, vegetal fragments, etc. that were never used in the earlier period.

During the first centuries of the second millennium BC, the shape and decoration of Wadi Suq pottery is strikingly similar all over Oman, from Musandam to Masirah island,. In the third millennium BC, such standardisation characterised only fine painted ware for funerary use, because it was produced in a very few centres, but not the pottery for



Figure 283 – A set of Wadi Suq copper items from a collective burial at Al-Wasit (photo German Mining Museum at Bochum).

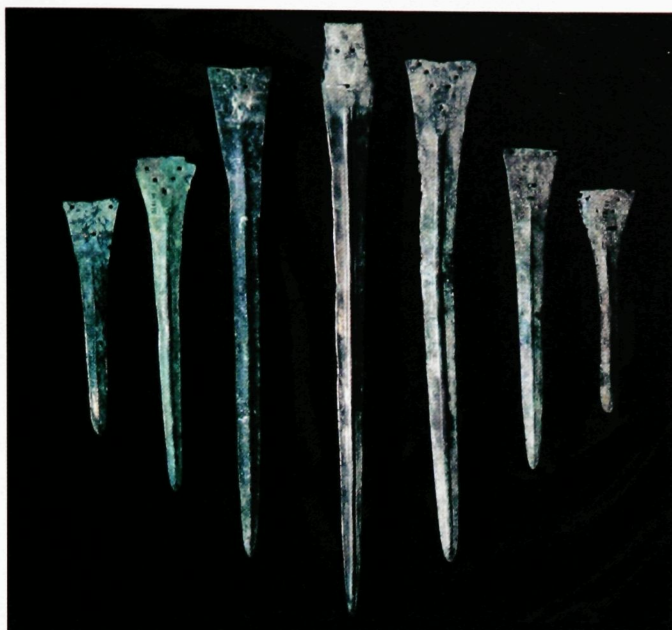


Figure 284 – A set of copper daggers found at Al-Wasit (photo German Mining Museum at Bochum).

daily use locally produced in every oasis. This is, however, combined with a diversity of ware, clays, temper, and low standardisation of manufacturing techniques that indicates, within a strong cultural unity, a much more widespread production. Another difference from the previous period is the disappearance of pots specially produced for funerary use. The pots deposited during burial belong to the various categories of fine ware, but these are present at the dwelling sites in significant quantities as well. These various points lead us to suggest new patterns of distribution and consumption, linked to changes in the society itself.

Excavations at Kalba, Al-Abraq, and Shimal have allowed us to establish an evolution in pottery production mainly characterised by the disappearance of painted pottery towards the middle of the third millennium BC. Later, during the third quarter of the second millennium, pottery becomes coarser and restricted to basic shapes for daily use. This may also be reflected in graves as some, such as the Qattarah grave in the Buraimi area, seem to lack any pottery. It may be suggested that pottery technology lost part of the role it acquired in material culture in the third millennium BC, where, apart from utilitarian use, it could also be both luxury and symbol. Still partly retained at the beginning of the second millennium BC, these values disappear. Pottery is no longer a valuable product but a commodity made locally with diminished skill and serving only a basic function as container.

Soft stone vessels also present significant changes (fig. 282). They are still produced but in a different range of shapes and decoration and using a larger variety of stone. While in the late third millennium BC emphasis was on fine-grained green stones, coarser materials are now widely used. The decoration seems less carefully executed, partly due to the texture of the stone itself. Old vessel types like cylindrical beakers disappear, while a new type of small jar with four lugs, sometimes pierced for suspension, replaces them. The earliest models are globular but quickly change to a more conical profile and are covered with a circular lid. Some bowls are provided with a short opened or tubular spout. Decoration also changes. Double-dotted circles are replaced by simple dotted circles, except for the earlier globular jars, and these circles are usually associated with various types of incised groups of horizontal or oblique lines that cover the whole of the vessel. These vases are very characteristic of the period and are found in almost any well-preserved grave, being also present, but rare, within the settlements. We may deduce from these findings and their contexts that, as before, they were produced to contain food preparations or delicacies in daily life that were also deposited in the graves as gifts for the afterlife.



Figure 285 – An electrum plaque with repoussé work, Shimal (the Ra's Al-Khaimah Museum) and Tuqaibah (Sharjah).

Metallurgy was still a very active industry. Not only do we know from the cuneiform texts that large amounts of "copper of Magan" reached the harbours of southern Mesopotamia in the early second millennium BC but that many copper objects were also found in the graves. Among them are numerous copper spearheads with a folded socket, a type that appears across the entire Near East towards the end of the third millennium BC. They are already known from the late Umm an-Nar tomb at Al-Abraq, where 22 have been found. These seem to have been a very common item, found both in collective and single burials. Other new common items include various kinds of daggers, like those with long triangular blades to which a handle of perishable material was attached by rivets. These are known from Qattarah and Al-Wasit and represent the largest known group of Wadi Suq metal objects fig. 283, 284). Daggers with a solid hilt and crescent-shaped pommel seem to appear towards the middle of the second millennium BC, together with copper arrowheads. These are again common items in the ancient Orient at around the same period. The deposition of weapons in graves already existed in the third millennium BC and represents nothing new, but it is at present our best local evidence for the importance of copper production during the second millennium BC. The dwelling sites only produced a few everyday items like copper pins, needles, and fishhooks of the same simple shape as before at RJ-1.

Before leaving metallurgy, one should note the development of some jewellery items, made of small gold plaques bearing one or two stylised repoussé animals and found at Dhayah, Shimal, and Qattarah (fig. 285). These were most probably sewn onto clothes. Similar objects have been found at the very end of the Umm an-Nar period in the tomb at Al-Abraq, possibly representing continuity for an object obviously of some symbolic significance for its wearers.

New Types of Burials.

The Wadi Suq period was first recognised through single burials near Sohar, and this in itself was a strong element for documenting social change after more than a millennium of compulsory collective burials, culminating in the largest Umm an-Nar graves with their complex rituals. The graves were dug in the ground of a gravel terrace and the sides of this excavation were lined with stones, forming a funerary chamber that was covered with flat slabs. The grave was enclosed in an oval of stones built on the surface and apparently covered with a low heap of gravel and stones. The body was deposited on its side in a crouching position and accompanied by a few offerings: painted pottery, chlorite vessels, and copper weapons. Similar graves have been excavated at Wadi Sunaysl near Ibri, Khudra and Al-Moyassar in Wadi Samad, and Sachrut Al-Hadri on Masirah island (fig. 287), while others have been found during prospecting at al-Batin near Ibra. Some particular well preserved ones were found in the recent excavations at Baushar by the Department of Excavations and Archaeological Studies in conjunction with Sultan Qaboos University and archaeologists of other Gulf countries (fig. 286). All these cemeteries are located on gravel terraces near present oases and could well have been associated with occupation of them, while Sachrut Al-Hadri on Masirah seems to be associated with a nearby shell midden settlement along the coast.

Collective burials still occurred. They are known at Qattarah near Buraimi (fig. 290), at Al-Qusais near Dubai, at Shimal (fig. 289), Dhayah, and Ghalilah and at many other places in the northern United Arab Emirates; also at Al-Wasit and possibly at various sites such as Mukhailif (Saham) and al-Hadhib (Suwayq) on the Batinah coast; but the precise context for these two chance finds is unknown. They are, however, very different from the Umm an-Nar ones, in terms of both their architecture and burial rituals. The excavated monuments present a variety of shapes, but the strict division into two non-communicating parts, so characteristic of the large monuments of the third millennium BC, does not now occur. The main type is represented by a long narrow long rectangular chamber (up to 20 metres long at Shimal) built over the ground, with a single entrance on a long side (fig. 289-290). The ruins at Shimal and Ghalilah indicate that they were covered with huge flat slabs, obliquely set from both sides to make a ridged roof. Other types include large oval



Figure 285: A Wadi Suq single burial at Baushar with two smaller ones in foreground. The cist grave of the main monument is surrounded by a double stepped plated, itself surrounded by a tumulus (photo joint Arabian Excavations at Baushar, Department of Excavations and Archaeological Studies.

monuments divided into two communicating chambers by a central wall, whose role, however, was mainly structural (i.e. supporting a roof made of large flat slabs) rather than divisional. The largest are truly monumental structures, up to twenty meters long and fifteen metres wide and comprising two concentric chambers. In shape the inner chamber was an elongated rectangle surrounded by a narrow corridor ca. 1.5 m wide. Entrance to the monument was through a narrow side and led directly to the access door of the inner chamber. The roof was probably made of large flat slabs. Bodies were deposited both in the inner chamber and in the surrounding corridor. As often happens in such monuments, entrances were small, some sixty centimetres wide and sixty centimetres high, just large enough for pushing a corpse through. Bodies were deposited in a crouching position on their side, their number sometimes exceeding sixty; and it seems that later arrangements occurred, like piling up the skulls in some areas or intentionally burning some skeletons, although this may have been less systematic than before. According to the few studies available, young children under a year old and adults, men and women, were buried together. They were accompanied by a variety of offerings, such as pottery, stone vessels, and metal objects similar to those found in single burials. The collective burial at Al-Wasit, for instance, unearthed by chance in 1984, contained, together with the skeletons of some twenty individuals, no less than 41 socketed spearheads, 16 daggers and swords, fragments of bronze vessels, arrowheads and razor blades, 44 chlorite vessels, shell rings, beads and pottery (fig. 296, see window 9).

The variety of funerary rituals in the second millennium BC does not seem to be limited to these two types. We have already mentioned the presence of Wadi Suq objects in earlier graves that seem usually associated with a single burial, as, for instance, in Umm an-Nar graves at Hili or Bisyah and in Hafit



Figure 287 – A Wadi Suq single burial (and two adjacent structures) on Masirah island, ca. 2000-1700 BC (photo German Mining Museum at Bochum).

type burials. These are apparently very common. In the Ja'alan, a re-used cairn near Ra's Al-Hadd, and another at site RJ-43, are at present the only graves of the second millennium BC known in the area. Another particular monument deserves attention. It was excavated at Asimah in a lonely valley within the mountainous part of Ra's Al-Khaimah emirate. It is an underground stone-lined burial chamber surrounded by a stone circle, rather similar to other Wadi Suq single graves, but incorporated into a series of long low bench-like platforms of stones, carefully built in order to link various shades of stones, and into which at least three other graves were incorporated (fig. 293). The monument may have been some sixty metres long when complete. Each tomb appeared to have contained a single burial, and in one case the bones were preserved well enough to recognise that the skeleton was deposited in a crouching position on its right side. All the graves had been plundered or re-used, but, according to the few original objects found inside, they are likely to date from the very beginning of the second millennium BC. These objects included a dagger, several copper spearheads with folded socket (fig. 295), and a hollow-footed chalice of copper (fig. 294), but almost no pottery. This impressive monument, with which were associated several smaller structures possibly used for worship, must probably be interpreted as the tomb of a high-ranking individual and his affiliates - the only one of its kind ever found in Bronze Age Oman. Several other single contemporaneous graves were found in the same area.

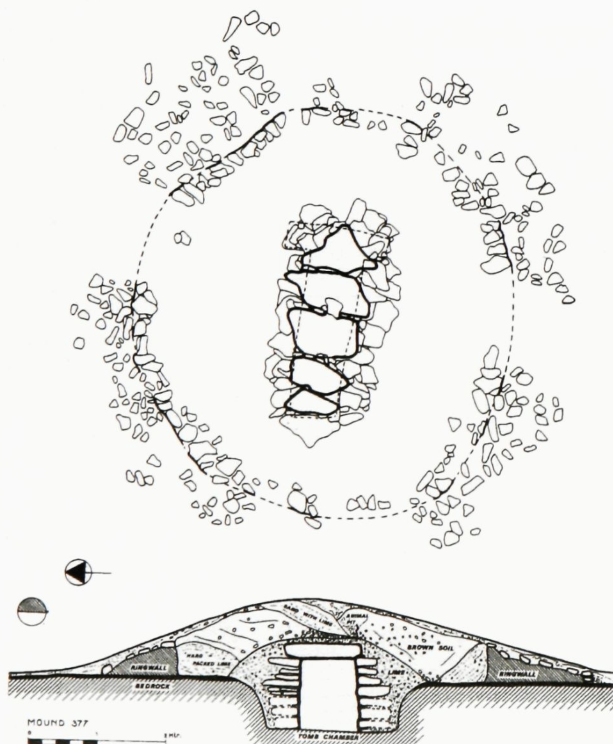


Figure 288 – Map and section of a burial mound at Sar, Bahrain. The similarity to Wadi Suq single burials is obvious (after Ibrahim 1982)



Figure 289 – A Wadi Suq collective burial at Shimal, Ra's Al-Khaimah Emirate, ca. 2000-1700 BC (photo French Archaeological Mission to Abu Dhabi).

A New Society.

We can infer, then, that by 2000 BC the Magan civilization of the late third millennium BC had quickly collapsed, to be replaced by a new social order. This change occurred probably within no more than a century, according to the few available carbon 14 datings. Judging from its material culture (pottery, stone vessels, metallurgy), the new society still enjoyed strong uniformity across the whole region. But there are obvious differences from some of the most distinctive and common characteristics of its predecessor, such as the burial customs and organisation of oasis settlements around the towers. Contrary to early impressions, the abandonment (or at least different use) of the towers does not mean that oasis life and oasis cultivation were abandoned, even if we do not, through archaeobotanical or archaeozoological studies have definite evidence that it continued. Date stones have been found in the Wadi Suq context at Al-Abraq and Ra's Al-Jinz - the dates at the latter most probably imported from the interior - and both sites yielded evidence of animal



Figure 290 – A Wadi Suq collective burial at Qattarah, near Buraimi, ca. 2000-1700 BC (photo French Archaeological Mission to Abu Dhabi).

husbandry. According to the bones found at Shimal, eaten animals included camel, sheep, goats, and cattle. Leaving aside for the moment the particular status of camels, this indicates that the full range of domestic animals was reared. The changes most probably do not lie in the elements included in the economic base but in the way these elements were used, and we may be pretty confident that, although less visible in the archaeological record, oases still existed during the second millennium BC. Current unanswerable questions concern their size and their relative contribution to the subsistence economy of the times. Was herding, and in particular nomadic herding, more important than before? When did camel domestication start? According to historical sources, this process was already complete in the early first millennium BC, when Arabian tribes mounted on camels raided the provinces of the Mesopotamian empires. One may wonder about earlier times for this domestication that allowed Arabian peninsula people to penetrate deeply, and on a fairly permanent basis, into the desert, and provided them with a fast and wide-ranging capacity of movement. We may anyhow assume that if the society of the second millennium BC participated in it, this domestication was not among the factors that initiated the transformation.

External causes like climatic change or external destabilisation are much favoured explanations for sharp transformations in archaeology. Intensification of aridity, sometimes advocated, is a poor argument, as oases were precisely the agricultural exploitation system for facing such problems and would certainly have survived the minor variation that may be detected by specialists of palaeocli-

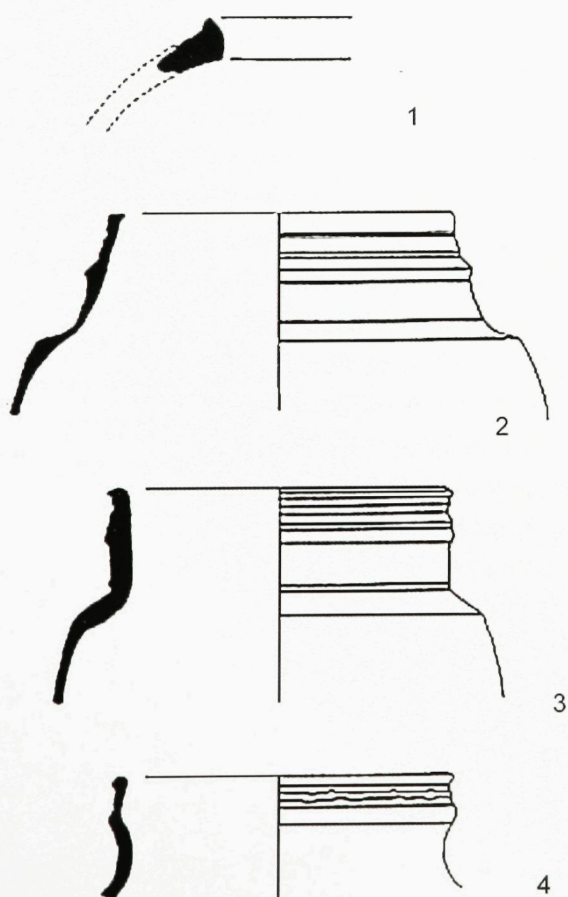






Figure 291:
Dilmun pottery (Bahrain) found in the Land of Magan 1 - Shimal ;
2 - Sur Gas Plant ;
3 - Al-Munayi;
4 - Kalba;
5-6 : Al-Abraq
(1-4 after Méry et al. 1998; 5-6 after Potts 2000).

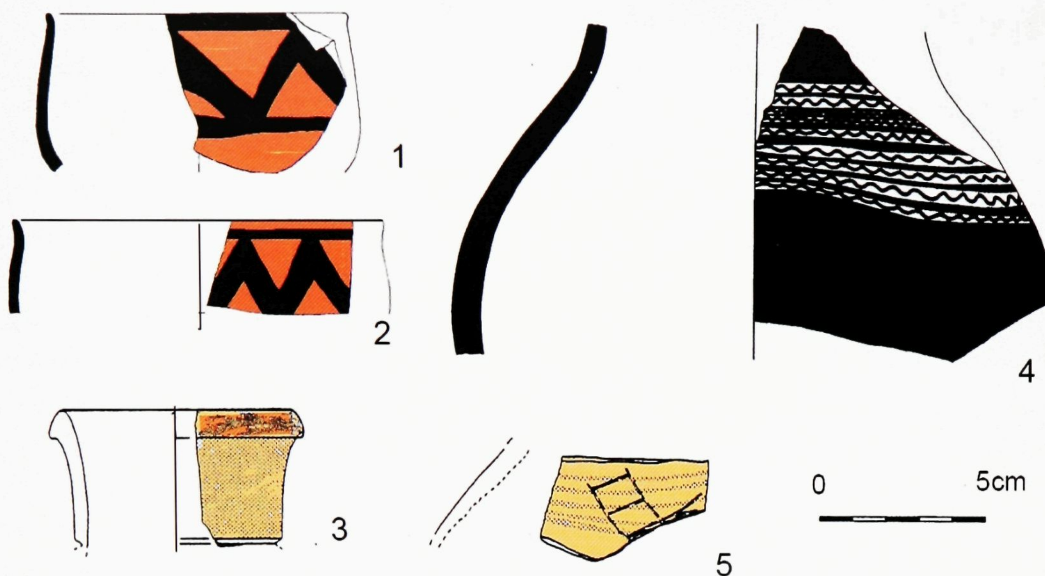


Figure 292 - Pottery of possible Indian origin at Ra's Al-Jinz structure 3 (1-2), structure 5 (3-5) and Ra's Al-Jinz 21, dating from the early Wadi Suq period, ca. 2000-1700 BC (Joint Hadd Project)



Figure 293 – Asimah, Ra's Al-Khaimah Emirate: a long funerary monument with four single graves, ca. 2000 BC (Vogt 1996).

matology. Of course, continuous lowering of the water tables, a phenomenon well documented during the third millennium BC, may have caused the drying up and abandonment of some irrigation systems. But the wealthy society of the late third millennium BC that knew and had long used these systems was certainly able to maintain and replace them when needed. If abandonment occurred at a local level, it seems difficult to generalise this to the whole of Oman. We had better seek other explanations than such a crude one. External destabilisation, on the other hand, favours the idea of invasion and replacement of one culture by another, a phenomenon often linked to the arrival of new people. We have already seen that repeated attacks by the Akkadian empire, whatever their short term impact, did not really influence the prosperity of the Land of Magan and there is at present no evidence to suggest that it did. On the contrary, they might have provoked stronger alliance bonds among the tribes, fostering higher forms of identity. Disruption of a main conveyor of wealth like international trade is another of these explanations and we should examine this idea in more detail.

Historical records indicate towards 1700 BC a reduction in exchanges between Mesopotamia and the East, combined with the fading political and economic importance of Southern Mesopotamia. The centres of power and trade shifted towards northern Mesopotamia and the chief commodities of exchange, including copper and tin, appear to have been redirected towards the circuits of the eastern

Mediterranean. Eastern Iran, that had always been a privileged partner, also seems to vanish at this time, and it is generally accepted that the Indus civilisation declines, or at least experiences drastic transformation, around 2000 BC. Distinctive phenomena like writing or stamp-seals disappear, but we also know that these areas remained populated, although in a new way with new organisations. Moreover, we at least know that by the early second millennium BC, when the transformation in Oman was under way, southern Mesopotamia was still flourishing under the powerful Isin-Larsa dynasty. The copper trade with Magan was still active, as mentioned in the cuneiform texts, even if it seems that the land of Dilmun, polarized between the islands of Bahrain and Faïlaka acted as a powerful middleman between the producing country and the consumption centres of Sumer. Archaeological evidence in Oman partly confirms these re-orientations. The contacts between Dilmun and Al-Abraq are represented on the site by hundreds of sherds of the red ridged pottery characteristic of Bahrain Island. They are found in both the late stratigraphic layers corresponding to the end of the Umm an-Nar period and in those of the early Wadi Suq period. Dilmun style stamp seals, either imported or imitated, are also present. Some pottery of probably Mesopotamian origin was also identified. Later, a few other sherds of Mesopotamian pottery related to the Kassite period, also found in Bahrain (which had around 1500 BC a Kassite governor) and a faience cylinder seal, probably originating from Susa in Khuzestan during that same period, indicate that relations across the Gulf never completely ceased. In the rest of Oman, red ridged pots or Dilmun type potsherds were found at Shimal, Nud Ziba, Kalba, and even near Sur (fig. 291), during rescue excavations prior to construction of the LNG gas liquefaction plant, confirming that in one way or another these relations concerned the whole country. A most interesting factor for the permanence of international exchange lies in the fact that Masirah is settled in the early second millennium BC, as shown by the extension of Wadi Suq occupation on the island. Copper exploitation at Jabal Sabbah and Jabal Sfaiq was certainly active by 1800 BC according to carbon 14 determinations, and we have already seen that Wadi Suq hillforts were strategically located near these copper mines. Such a development of copper exploitation may be linked to trade overseas, chiefly with the post-Harappan centres of Gujarat that were still very active in the first part of the second millennium BC. The recent excavations at RJ-1 in Ra's Al-Jinz have confirmed these links, as potsherds belonging to several varieties of Indian pottery with close similarities to Gujarat products have been found (fig. 292). The presence of date stones on the same site and the making of beads from *Conus* shells indicate that exchange circuits towards the interior were still active. Their suggested disappearance or diminution may simply be due to the way archaeologists are looking at their information and to obvious gaps in it that are linked to the fact that archaeology in Oman is still in its infancy. Whatever the reason, the supposed collapse of foreign exchanges cannot be singled out as the explanation for the sudden transformation that happened around 2000 BC and which marks the beginning of the Wadi Suq period.

Other possible explanations are linked to the dynamics of the societies themselves. These explanations are not much favoured by many archaeologists, as they cannot be directly grounded on sites, objects, and plant or animal remains. They are also difficult to explain to a general audience as this requires more general consideration of the societies themselves. Anyone who has read this book from the beginning will be aware that we are not afraid of such views. Even if we accept that the Wadi Suq culture is to some extent linked to other cultural transformations throughout the Middle East, we have insisted enough on the particularities of Omani society during the Early Bronze Age to feel obliged to address the question of how this particular society behaved amidst these general transformations.

Change in funerary rituals is certainly one of the most obvious aspects of the new society, even if the variety of burials is difficult to explain at present. We do not know on what criteria the choice of single or multiple burials was made. Looking at a map, these will appear as a difference between a northern area with collective burials (Shimal, Ghalilah,

Dhayah, Al-Qusais, Qattarah, Al-Wasit) and a southern area with single burials (Wadi Suq, Wadi Sunaysl, Al-Moyassar, Khudra, Batin, Masirah), although this crude distinction should probably be modified. There are also single graves in the north, for instance at Shimal, and the single graves of the original Wadi Suq cemetery are close to the large collective burial of Al-Wasit. Beyond possible local differences, what is important is that people are now buried either as individuals or as members of a group, probably kin-based, that appears to be smaller than the community involved in Umm an-Nar tombs. If one adds the large amount of "casual" burials in earlier graves, the situation appears in striking contrast with what prevailed only a century before. The apparently strict rule of burial, through which any member of the group, irrespective of his status, was incorporated through rituals into a physical community of the ancestors, seems to have disappeared. It is no longer a social requirement.

The choice between single and collective burial was not new. Collective burial is known in other parts of the oriental world during the Early Bronze Age, although probably never reaching the scale seen in late third millennium BC Oman. We know it, for instance, among the pastoral tribes of Luristan in western Iran, those of the Sumbar valley in western Turkmenistan, and also along the north-western margins of the Arabian desert, notably in the large cemetery of *Bab* edh-Dhraa in Jordan. The Wadi Suq single graves, however, are very similar in their principle to monuments already in use for a few centuries in other parts of eastern Arabia, such as those known from the *Jabrin* oasis in Saudi Arabia to the upper Euphrates valley, and of course in the *Dilmun* area at Dhahran and Bahrain. By adopting, at least partly, similar funerary customs, Oman loses its unique character when compared with the rest of eastern Arabia. We have already seen that such behaviour was more an expression of jural rather than real equality among the living members of the community. Prominent individuals and their next of kin, dwelling in the towers or owning them, merged with everyone else in the next world. They entered it, however, with luxuries and valued foreign objects that, in the same process, went back to the community as a whole. There may have been a moment during the last centuries of the third millennium BC when this ideology was challenged by the affirmation of social hierarchies as they existed in daily life, and when the elite started promoting this new system as the actual world order. They knew it from the cities and empires of Mesopotamia, Iran, and the Indus, and even from neighbouring Dilmun, where "royal tumuli" appear about the same time at 'Ali and Janabiyah (Bahrain), while other single burials display a whole range of variation, from poor to ostentatious.

The "royal" graves are an affirmation before the people of the power of a dead leader and the legitimisation of his descendants as a ruling family. They appeared towards the end of the fourth millennium BC in Mesopotamia during the establishment of the early states. The large monument at Asimah may be interpreted in this perspective. Despite having been heavily plundered, it was provided with grave goods (copper spearheads, a large copper vessel) that strengthen the idea of a rich burial for an exceptional individual. It was built precisely at the turning point between the two situations and is at present the first and only one known that can be considered as a "chief's burial". It should be noted, however, that some structures that are possibly similar have been reported in the same area at Wadi Ashwani, Qidfa, and Kalba, but in a very elusive way. We need more details and excavations. A few relatives were also buried in separate graves inside the monument, which was probably a ceremonial place. Before emergency excavations to prevent full destruction of this unique monument were carried out, there were three smaller alignments in the vicinity that had been seen by Beatrice de Cardi in 1971. Several dozens individual graves were also found, mostly dating from the Wadi Suq and the very late Umm an-Nar periods. This occurred during the main excavation campaign led by Burkhardt Vogt and the graves were mostly similar to the Wadi Suq single graves previously described. It is probable that the "chief" of Asimah was surrounded by his kinsfolk but was no longer to be confused with them, being in fact separated from them by a small dry watercourse.

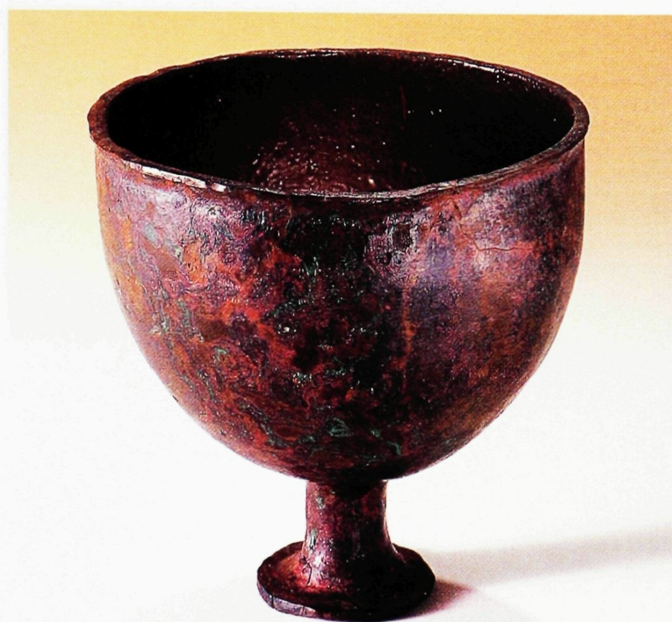


Figure 294 – Asimah: a copper vessel found in one of the graves of the funerary monument (Vogt 1996)

The social changes that took place around 2000 BC may have been entirely linked to issues around the acceptance or rejection of social hierarchies that undoubtedly were in play during the late third millennium BC. Probably effective in economic, social, and political life, they were denied at an ideological level by the burial rituals. The choice must have been between two types of society. The old one was composed of various kin-based groups of individuals who considered themselves as equals, in principle at least, acting independently and often in different configurations according to circumstance: the assebiya's peopleinteracted as equals, in what specialists call "heterarchies", as opposed to "hierarchies" with their one-way oriented pyramidal architecture of relations. The new one would have definitely put into ideology and action the power and wealth of some leading families and established permanent hierarchies. Pressure towards it was probably very strong by the end of the third millennium, due both to external and internal factors, and this required the breakthrough of the powerful ideological step of jural equality. Such a breakthrough may have been accomplished for example at Asimah. One may wonder why it happened in such a remote area and apparently not, as far as we know, in the large centres along the piedmont or coast. The answer may lie precisely in that marginality. We are so used to a picture of the world moving at the instigation of the centres that we forget that innovation may arise at the margins, whereas the third millennium social system, undermined by the same forces that operated in the centres, could also be less resistant to the initiatives of an energetic leader.

From what we know about what happened next, this was not successful in the long term. Instead of the consolidation of hierarchies, what we see both in collective and single burials, as well as in the nuclear family houses at Ra's Al-Jinz, is a return to heterarchies at a lower level. Symbols of the former order that came to be linked with the tendency to build hierarchies, like the towers, are abandoned or resettled in a different way, as is obvious at Hili, Al-Abraq, Kalba or Bat. From the apparent fading of occupation in the oasis areas, we may also conclude that the settlement of large groups in the oases tends to diminish. In other words, the centripetal tendency to coalesce in permanent forms of leadership power had lost its attractive capacities.

For reasons that can yet only be speculated on, but which we suspect were embedded in the egalitarian social ideology, resistance to change was always strong enough to prevent attempts to develop hierarchies from within. Once each of these attempts failed, society had to be re-consolidated around the old values. In the process some early aspects were left behind, while limited innovations were introduced. In the archaeological record these may appear as minor changes in a substantially continuous picture.

Specialists of modern societies and economies have developed sophisticated mathematical models to account for such situations of change. One, rather close in our opinion to the situation of Oman, is called the "blue loop model". According to its layout, in a given social situation every individual and group operates according to its own interests, as well as to those of relatives and allies. The social rules are enforced by individuals and institutions at different levels, and they also operate to ensure their welfare and that of their descendants. Moreover, a society is not a closed system but interacts with other



Figure 295 – Asimah: some of the copper items from the funerary monument (Vogt 1996).

surrounding systems, receiving various kinds of inputs as goods, information, and ideas. We can put behind these abstract terms real entities from late third millennium Oman, such as nuclear families, household groups like those of Ra's Al-Jinz, lifetime leaders in their towers, Mesopotamian or Indus valley rulers, copper trade agents, etc. At some point, this particular sequence of individual and collective entities will tend, more or less unconsciously for the actors, to strengthen a driving force within the system - what contemporary specialists call an "attractor". With the system continuing to work, this attractor begins to induce changes in the social mechanisms. These in turn might conflict with the ancient rules and the interests of some of the individual actors, who will start rejecting them. At this point, consciously or not, choices must be made. The Asimah "leader", if he ever existed, was obviously someone who chose the new option: the establishment of a hierarchical order in the interests of his family group. Many other heads of family probably had the same project in mind and would have competed with him and among themselves. On the other hand, for most members of that society the project would have been unacceptable, since it was contrary to their fundamental values. Resistance was so strong that in the long run no leader was able to establish his power.

This is what theoreticians of social evolution call a "catastrophe", and there is even a similar model called "Blue-sky catastrophe", a name apt for what may have happened in Oman but accounting for a different process. In such a situation, the system cannot continue as before. The intricate network of alliances breaks down and a period of instability starts, during which the strongest communities have to reorganise their relations around fresh principles until a new order arises, with new alliances, new forms of exchange and communication, and new ways of displaying, or hiding, ideology. One should be aware that not all these ways are accessible to archaeologists. This may, for instance, account for the disappearance of the towers. In the meantime, some small groups may open or re-open new options such as more movement across larger areas, dwelling in lighter structures, using fewer or more perishable material goods. Such a splitting and change in alliances may be responsible for the lower visibility of people in the archaeological record and even for their apparent eclipse for a a period of time. This is probably what happened in Oman at the beginning of the second millennium BC. The number of small fortified settlements - Al-Abraq, Shimal, Kalba, Hili, Al-Wasit, Ra's Al-Jinz RJ-1, and many others - combined with the amount of weapons in the burials may suggest that this may not have been a peaceful period, although even this is questionable. Only future field research designed to check these ideas may help us to go further, keeping in mind that "dark ages" occur not only in archaeological remains but also, and sometimes mainly, in the way archaeologists look at them. ❑

Window 9
Copper in the 2nd Millennium BC (Wadi Suq Period)
By Gerd Weisgerber

After the end of the Mesopotamian trade in the first centuries of the second millennium BC, copper production continued in Oman, although on a smaller scale. Traces of 2nd millennium smelting are rare and difficult to find. Remains of kilns and other installations show that the same types of ore and furnace were used as in the previous tradition, and that there was no change in the smelting technology.

Yet the archaeological remains of this time changed dramatically. There were no longer any tower tombs on hills or terraces. The dead were now buried in subterranean stone cists which of course cannot be found as easily as cairns on top of hills or mountains. Settlements are rarely found, but sometimes, when late Iron Age cemeteries were excavated, there were Wadi Souq tombs among them, thus indicating the occupation of the same oasis areas 1500-2400 years earlier. Wadi Souq cist tombs beside heaps of fine black slag at the ore deposit of Wadi Salh near Samad are the best evidence for copper production of that time in this area.

The community grave at Al-Wasit (fig. 243) in Wadi Al-Jizzi contained about 18 individuals. It surprised archaeologists by its breathtaking number of metal artefacts beside 50 soft stone vessels: 16 swords and daggers and 42 spearheads suggest local production and in fact there are still many tons of slag between the houses of this village. On the one hand, the weapon types are those of the outer world around Oman. They indicate that at least the



Figure 296 – The copper hoard found in a collective Wadi Suq burial at Al Wasit, Wadi Al-Jizzi (photo German Mining Museum at Bochum).



Figure 297:
This Wadi Suq burial at Masirah site 38 contained a complete copper vessel (photo German Mining Museum at Bochum).

weaponry of the elite was up to date. It is nearly all of pure Omani copper: only the latest daggers are of bronze. It is obvious that in those days tin for bronze was rarely available. This means that the elite knew what was going on elsewhere but had no possibility of participating in the international tin trade which flourished exactly during the first half of the 2nd millennium BC both in Anatolia and Mesopotamia and later in the Mediterranean. Whatever the tin's provenance, recent research by the German Mining Museum has shown that there exist vast Bronze Age tin mines in Uzbekistan and Tadjikistan. Tin was possibly also available from mines in India.

Some hundred years later the evidence changes again. In a 13th-century warrior tomb at Nizwa the weapon types correspond to those of that time elsewhere in the Near East, but now they are of bronze. Tin had become available again and remained so during the 1st millennium BC, as demonstrated by some hundred bronze bangles of the Selme hoard from Ibri. Also the seal of that tomb corresponds in design and motif to those abroad. Closer contact seems to have taken place again. ❑

Chapter 10

The Iron Age: New Developments on the Eve of History

Chapter 10
The Iron Age: New Developments on the Eve of History

Around 640 BC, Padê, king of the Land of Qadê, came to pay his respects to the most powerful and feared sovereign of the Orient, Assurbanipal, the last great king of Assyria (668-627 BC) in his capital at Niniveh. According to the cuneiform inscription that recorded it, he carried with him a rich tribute and arrived after a journey of six months across deserts and steppes from his home town at Iz-ke-e. Specialists long ago established that *Qadê* was at that time the name given to Oman by the Mesopotamian scribes and that Padê is a west Semitic name, but for a long time no one noticed the name of its capital. Iz-ke-e, or *Izkê*, sounds similar to modern Izki, which lies at the southern outlet of the Sumayl gap towards the interior piedmont of the Hajjar mountains, and which, according to local tradition, is considered the oldest town in Oman. Although it has never been excavated, and although most of it must have suffered from the rapid development of the town in the recent past, a large site that was certainly settled by the time of Padê's voyage has been located at Izki by Oman's Department of Excavations and Archaeological Studies. For the first time, after more than a thousand years, the country reappears in the historical records. It will henceforth never leave it, even if the evidence for the first millennium BC remains rather elusive. Archaeologists used to call this period the Iron Age, marking a period of general evolution across the whole Near East. The name may be misleading. The use of iron is in fact very restricted everywhere before the 8th century BC, and even much later in Oman where it comes into general use only in the fourth century BC, towards the very end of the time span commonly called the "Iron Age".

All this is mainly a matter of artificial convention. One point, however, is certain: around 1300 BC, at the end of the Wadi Ṣuq period, new transformations begin that culminate around 1000 BC in the creation of a new regional culture, familiar all over the Oman peninsula. It appears as a kind of a revival of ancient oases, although, as we have seen, these had never completely disappeared.

An Elusive Prelude: Iron Age I

The earliest stage of the Iron Age, technically labelled Iron Age I, has been mainly established on the stratified sites of the United Arab Emirates at Shima'l and Kalba. Remains largely consist of post-holes left by light constructions of wood and palm fronds which at Kalba were surrounded by a stone and mud-brick defensive wall and a ditch. No proper tomb of this period can be identified, but, again in the northern Emirates, collective graves of the Wadi Suq period were reoccupied throughout the Iron Age and it is probable that they were in use during Iron Age I as well, although particular objects belonging to this period are difficult to separate from the rest of the material found in the graves.

The period is characterised by very crude hand-made pottery, with coarse grit tempered paste, simple shapes, and no decoration. Due to its minimal distinctive aspects, this pottery is difficult to recognise during surveys, which may explain why so few sites are reported. Contrary to what happened during the Early Bronze Age and at the beginning of the Wadi Suq period, pottery is no longer deposited in the graves as a luxury item. The very few pots found in burial contexts are simple and crudely made, and were probably put there as containers for perishables like food or liquids. It seems that pottery has completely lost its symbolic value during the last centuries of the second millennium BC, continuing a process of depreciation already initiated during Wadi Suq times. Other classes of material may, however, help, notably bronze tools and soft stone vessels, although their chronological setting remains at present controversial. This is mainly due to the impossibility of using the basic method favoured by archaeologists for rebuilding the chronologies of the

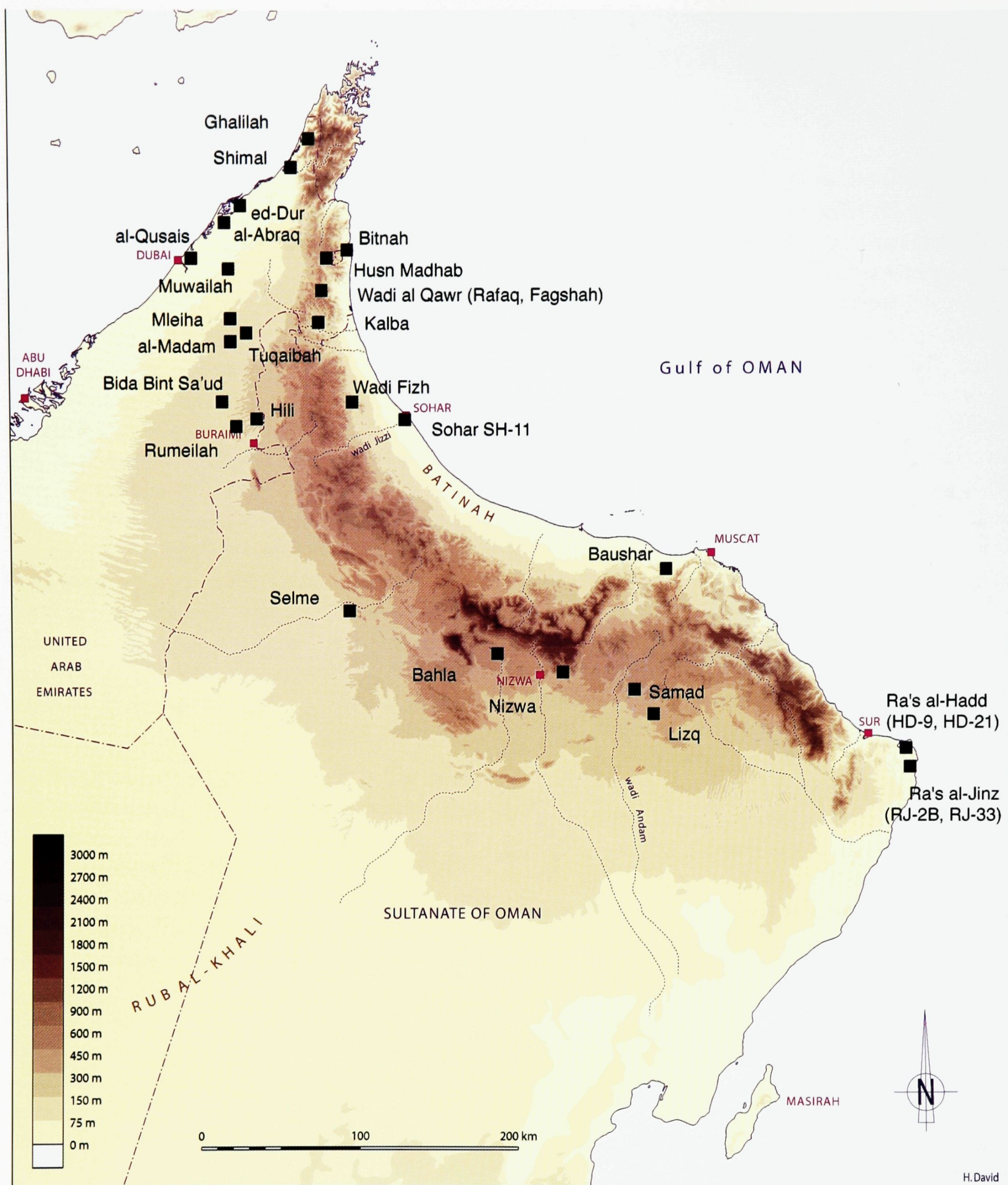


Figure 298 – Oman during the Iron Age. (drawing by Hélène David).

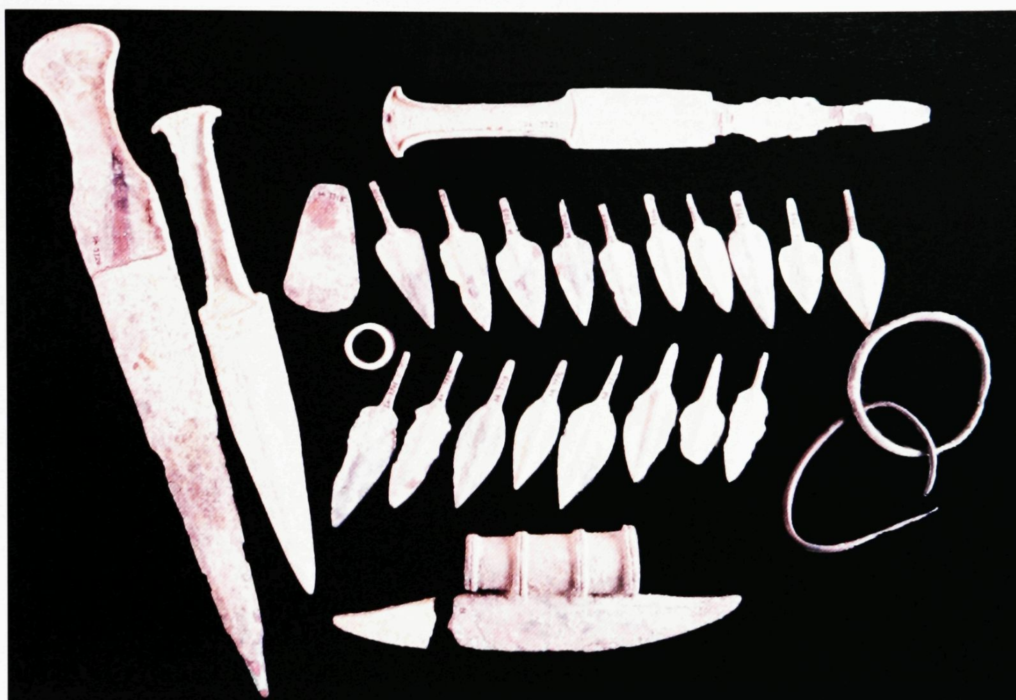


Figure 299:
A set of Iron Age I bronze items found in the "warrior's grave" near Nizwa. They comprise mainly weapons: three daggers, 18 arrowheads that probably were deposited with the arrows in a quiver and an axe or halberd. Personal items are a finger ring, 2 small bracelets and a trapezoidal blade, probably a razor (photo German Mining Museum at Bochum).

past: the association in a grave of several classes of items together with carefully dated classes of pottery that are assumed to have been put together in a short time or at least within a few generations.

In the early sixties, Danish archaeologists recovered from a cairn on Jabal Hafit a bronze sword closely resembling those known in Iran since around 1300 BC, and this gave them a provisional date for these graves, which we know are in fact much older. This was the first Iron Age item found in the Oman peninsula. Since that time, many similar objects have been recovered from graves, and even from settlements, but their date can cover too long a time span, including both Iron Age I (1300-1100 BC) and Iron Age II (1100-600 BC).

One collection, however, is of particular interest. It was discovered in the late seventies by a local farmer and honey collector on the slopes of a limestone mountain, the Jabal Al-Hawrah east of Nizwa, near the ruins of an impressive hillfort, locally known as Sharjah Al-Hadirah, that may have been inhabited during the second part of the second millennium BC and also later, during the medieval period. There, in a passage between two large rocks closed at both ends by a wall, were found a battle-axe, three daggers, twenty-seven arrowheads, a razor, a finger ring, and two bangles of bronze or copper, together with three soft stone vessels, a pottery bowl, a stamp seal of calcite, and a few carnelian beads. On the basis of such an inventory, the tomb, a rather casual monument actually, was interpreted as the grave of a wealthy warrior (fig. 299). The pottery, although not very distinctive, may be considered as being of Iron Age I provenance, and so too the soft stone vessels, as they do not fall within the range of Wadi Suq or Iron Age II models. The seal is a small hemisphere with an engraving of two goats eating from a tree, a very common theme in the mythologies of the ancient Orient, but this is at present a unique piece in Oman.

The weapons of the warrior's grave at Nizwa and some of the pottery vessels of Kalba display general similarities with Iranian objects of the same age. This is not surprising, given that relations on both sides of the Strait of Hormuz have continued for millennia. Unfortunately nothing else can be said. We can only conclude that by the end of the second millennium BC Oman was not empty, that some small communities lived in fortified settlements, that some others had a very mobile lifestyle, and that some of their members were more or less permanent warriors. This is a limited, and somewhat disappointing conclusion, as this situation precedes a new period of high cultural development that arises suddenly within a few generations, around 1000 BC.

The Oasis Revival of Iron Age II (the Lizq Period)

Archaeologists call this period the Iron Age II in the Emirates and the Lizq period in Oman, although the whole country displays at that time a strong cultural unity. The most outstanding aspect of the new culture is that almost all ancient oases appear to be resettled, sometimes on a larger scale comparable to that of the Early Bronze Age or even larger. Several dozen settlements and many cemeteries are known, indicating a significant growth of population, a stabilization of settlement and a revival of agricultural investment. Many *falaj* are dug, new fields established, painted pottery is again made, produced with a wider diversity of shapes and uses, new types of soft stone vessels and new metal objects are manufactured. But, most important, for the first time in a thousand years, the available information makes possible some insights into the local society and some, admittedly disputable, historical statements.

Iron Age II sites have been located in every ecological compartment: the piedmont plains, the coastal areas, the wadi valleys, the hills, and the mountains (fig. 298). Built of mud-bricks or stone, they include open villages, fortified villages, hill-forts, and campsites. The most spectacular of the open mud-brick villages have been excavated at Hili, Muwailah, Rumeilah, and Tuqaibah in the U.A.E., where the houses, buried under sand dunes, are sometimes preserved up to roof level (fig. 300, 301). Houses had plastered floors and were entered through doors with elevated sills to prevent animals and sand entering. Windows were reduced to narrow slits below the roof in order to provide protection from sun and heat. The roof was supported by small horizontal beams covered with mats and earth. Some rooms contained large storage vessels. Average houses comprised a few rooms, generally three to four, but sometimes more, and were grouped in clusters of four or five, linked together by joining walls or inside an enclosure where most domestic activi-



Figure 300 - An aerial photograph of the Iron Age II (ca. 1000-600 BC) village at Hili 2 under excavation (photo French Archaeological Mission in Abu Dhabi).



Figure 301:
A house of the Iron Age II settlement at Hili 2. It was buried under sand almost up to the roof (photo French Archaeological Mission to Abu Dhabi). Note the small holes near the top of the walls to receive the wooden beams supporting the roof and the small narrow window below it. The door on the left was blocked in antiquity by mudbrick, a practice very similar to what is still done in the Oman countryside when leaving a house for some time. (photo French Archaeological Mission to Abu Dhabi).

ties took place. Others were much larger, containing up to twenty rooms. Similar villages in stone or mud-bricks are known in Oman, in particular at Al-Moyassar, at Raki 2 north of Ibri, and at Zahra 2 in the Arja copper mining area west of Sohar. Excavations at Al-Moyassar and Raki have uncovered large houses with many rectangular rooms, where domestic and craft activities took place. For some fifty centimetres the walls are made of stones. The floor at Al-Moyassar was paved with broken mud-bricks, suggesting that mud-bricks were possibly used in the upper parts of the construction too. Both villages were at least four or five hectares in size, and this was also the size of Zahra 2, where many large houses can be seen from the surface on both sides of Wadi Bani 'Umar. These three sites were related to metallurgical activities. Many other sites still await discovery by archaeological surveys. Some within Sohar itself (SH-11) and on the outskirts of Seeb on the Batinah coast could never be properly studied and by now have been destroyed. We have already mentioned the presence of important Iron Age remains at Izki. Another site (BB-4) was recognised two kilometres south of Bahla, with traces of rectangular stone houses extending for some 400 metres along a wadi, and another one two kilometres north of Bisyah (BB-15), etc. Ongoing excavations by the Department of Archaeology of



Figure 302 – A compound of Iron Age II houses at Tuqaibah (Sharjah Emirate), showing several habitation units inside the same enclosure (photo Spanish Archaeological Mission to the United Arab Emirates).

Sultan Qaboos University at Manal in Wadi Samail have uncovered on several hectares the remains of a fortified village with stone houses that was first settled during this period, probably at the outlet of a falaj system issuing from the nearby mountains. This would be the same system that still watered a large medieval settlement, and even the modern village, and was possibly already used in the Early Bronze Age, as several graves from this period have been found locally. Like the Early Bronze Age sites, we may suppose that many Iron Age II sites were destroyed long ago by continuities of oasis life over a period of 2,500 years. For instance, one may notice houses of Iron Age date at Hili, buried at the bottom of a nud_d, those huge heaps of earth accumulated along the palm tree gardens when deepening them to cope with falling falaj levels. Some villages were fortified and present a much denser internal planning, as one would expect. This is the case with Muwailah near the coast of the Emirate of Sharjah and Wadi Fizh 2 at the foot of the mountains between Sohar and Shinas in Oman. Wadi Fizh 2 has a rectangular stone enclosure, some 150 by 75 metres, and was provided with corner towers and at least one fortified door on a small side (fig. 303). The plan of several rectangular houses in a rather dense setting, apparently arranged in clusters but leaving room for some empty spaces, is apparent from the surface. The presence of Iron Age II pottery in the modern cultivated area nearby probably suggests that these were already fields during this period, as broken pottery is often transported to the

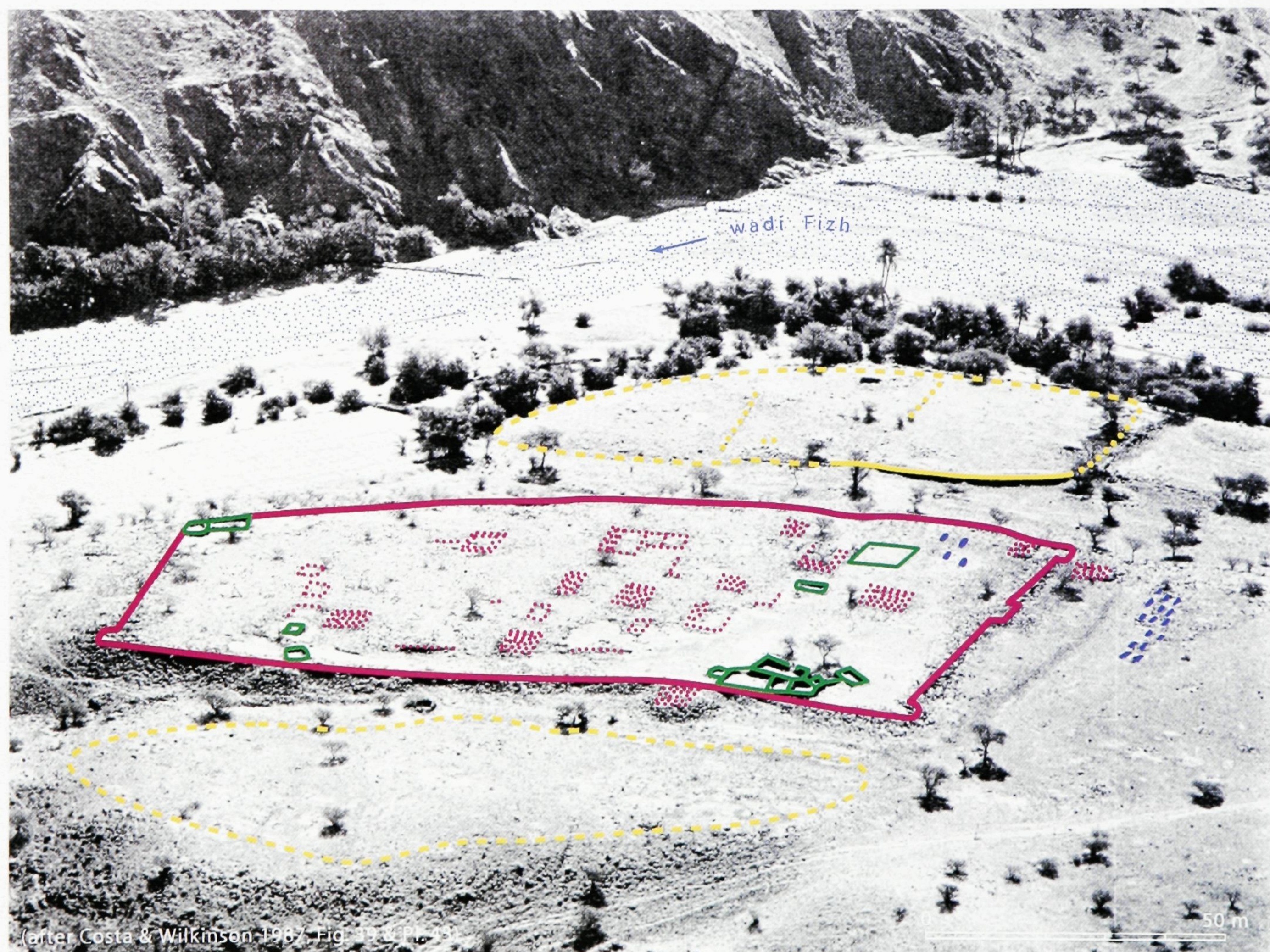


Figure 303 – An unexcavated Iron Age village in Wadi Fizh. Interpretation after an aerial photograph (drawing by Hélène David after P. Costa and T.J. Wilkinson, JOS 9).



Figure 304 - The hillfort at Lizq (photo German mining Museum, Bochum).

fields with manure from domestic dumps. Wadi Fizh 2 is a clear example of what could have looked like one of the many oasis settlements of the Omani Iron Age.

In many cases, at Al-Moyassar, Hili, Muwailah or Al-Madam for instance, the settlement was associated with a *falaj*. Those excavated at Hili and Maysar turned out to have been in use during Iron Age II (or the Lizq period) and were abandoned later. Geological studies, carried out independently of archaeology, have uncovered two disused *falaj* at a'Raddah near Nizwa that follow the orientation of the a'Raddah and Jill *falaj* presently in use. Carbonate deposits from them have been dated by carbon 14 to the third century AD for the more recent one and to the ninth century BC for the older one, which must therefore have been in use during the reigns of Assurbanipal and Padê of Izki in the seventh century BC.

Another type of settlement is represented by hillforts, of which the best known today is Lizq itself (fig. 304), rising eleven kilometres south of Al-Moyassar in Oman. It was partly excavated by the German Archaeological Expedition at Samad ash-Shan. The enclosure of large stone blocks carefully assembled with clay mortar is still evident around an area of some two hectares on the top of the hill. Several rectangular rooms were located inside, mainly against the wall. The most impressive feature is a staircase of 79 steps lined by two low walls that gave access along the slope to a fortified well at the bottom (fig. 305). Other hillforts are known, in Oman at Qarn Al-Muallaq overlooking the village of Zahra 2, in the Emirates notably at Rafaq 2 in Wadi Al-Qawr or Husn Mudhab, and at Husn Awallah near Fujairah. Their plan is broadly similar to that of Lizq and a staircase along the slope was recognised at Rafaq 2 and Husn Mudhab.

Several exceptional buildings have been found during excavation of Iron Age II sites at Rumeilah, Bida Bint Saud, Muwailah, and Bitnah. These all include a large room whose flat roof was supported by rows of wooden pillars and they were provided with particular types of pottery and other items that lead us to interpret these buildings as communal houses where meetings and religious ceremonies could take place (fig. 306 and 325, window 10.2).

The organisation within large houses or compounds of smaller ones, the presence of buildings with large meeting rooms, and the existence of hill-forts, some obviously overlooking a village, as at Qarn Al-Muallaq, introduces us to the complexity of the social and political life of Iron Age II communities. Not far from Rumeilah, a further step is represented by Hili 14. Here, still preserved up to a height of some two and a half metres, is a large rectangular building, some sixty metres by fifty. It appears to be fortified with a one and a half metres wide wall, strengthened by 2.5 by 3.5 metres rectangular bastions fig. 307). These are along the walls or at some corners and there is a fortified entrance on the long northern side. The building has not been excavated, except for a small sounding, but most of the plan can still be read from the surface where the mud-brick walls appear as whitish lines on the surface of the sand that buried them. Inside the fortified area were some fifty rooms, most abutting the main enclosing wall but some standing free in the western part, while the eastern part seems to have been a large empty space. In between these two areas, perpendicular to the southern wall, there is a rectangular building, twenty metres long and eight metres wide, comprising a large room to the north, some eleven metres long, and three rows of smaller rooms at the back, built between the main hall and the enclosure wall. Inside, the long walls of the large room were strengthened and decorated by four square pilasters placed at regular intervals that may also have supported the main wooden beams of the roof. It is possible that, once carried out, excavations will uncover the base of rows of pillars supporting this roof. At the back of the hall, that was apparently entered by a door on the northern wall, two small doors gave access to the back rooms. A sounding in one of these



Figure 305 – Steps leading from the spring to the hillfort at Lizq (photo German Mining Museum, Bochum).

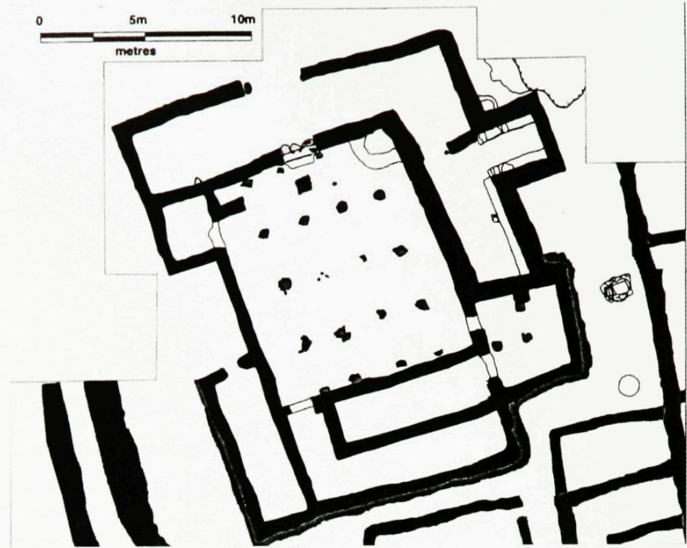


Figure 306 – The Pillared Building at Muwailah, Sharjah Emirate (after P. Maggee, AAE)



Figure 307 – Plan of the unexcavated Iron Age building at Hili 14 (Iron Age II, ca. 1000-600 BC). It was buried under sand and preserved up to a height of some 2.5m. The door seems located in the north-western corner. There were square towers outside the enclosing wall and probably in the corner. Inside are various rooms along the outer wall, and a long room with inner buttresses, possibly a reception room, against the southern wall. It can be interpreted as the residence of a powerful individual ruling in this area (French Archaeological Mission to Abu Dhabi/ Paul Garczinski).



Figure 308: A view of the aggregation of Iron Age burials at Bawshar, the Capital area (photo Department of Excavations and Archaeological Studies).

rooms, dug along the inner side of the enclosing wall, has uncovered a group of jars, showing that it was used as a storage room. Hili 14 received a permanent supply of water from a branch of the nearby falaj, starting just from the point where the water begins flowing in the open. Such a construction is reminiscent of contemporary examples in western Iran and may be interpreted like those as the residence of a powerful individual, his family, and affiliates. It recalls to some extent the forts that pinpointed the traditional Omani oases, as for instance the nearby fort at Al-Buraimi. In his home town at Izki, king Padê may have dwelt in a similar residence.

Iron Age graves have been found and excavated in their hundreds. Most are individual burials, grouped in cemeteries and with a rather large variety of types. Cairn structures, round, oval or square, are grouped in cemeteries on low hills or slopes, often re-using the material of nearby Early Bronze Age cairns, but they have never been found in such a condition that it can be decided if they were individual or collective. A cemetery of several cairns excavated at Ra's Al-Hadd HD-9, however, has revealed graves with one or two skeletons that can be classed as individual burials.

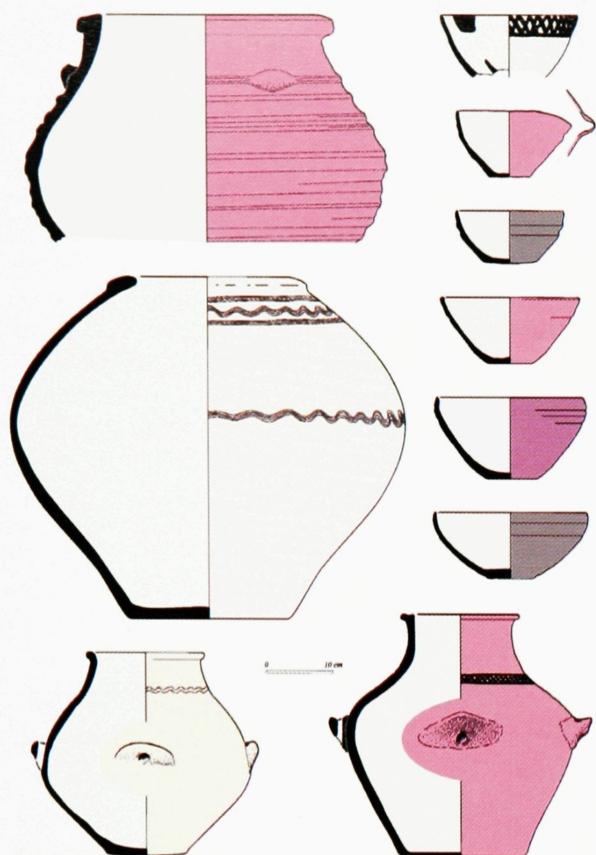


Figure 309 – A selection of common Iron Age II vessels used in daily life (drawing by Hélène David).

In the northern part of the Oman peninsula, Iron Age II burials are often found inside earlier Wadi Suq collective burials, but they seem to be individual burials within an existing monument rather than the result of a collective ritual. Casual burials are, as a matter of fact, frequently found in earlier graves from all periods, and all appear to be individual depositions. Underground burials in stone-lined pits, covered by large flat slabs, also exist. They are grouped in cemeteries, like those excavated at Mazyad or the few ones found at Saruj in the Capital Area. There are also simple pits with a side chamber in which the body was deposited, in a tradition known in eastern Iran for several millennia, like those found at Al-Qusais near Dubai. Excavations carried out by the Department of Excavations and Archaeological Studies at Baushar in the Capital Area of Oman have uncovered an exceptional cemetery, composed of 81 small cairn graves made of stone boulders and arranged in a kind of honeycomb pattern (fig. 308). They are single burials, containing the remains of both men and women. This spectacular monument does not match any other known discovery, and certainly corresponds to a small community settled nearby and still textured by kin-based relationships.

When found in good condition, all graves have yielded abundant pottery, copper weapons and ornaments, soft stone vessels, and various types of beads. These graves are rather rich, but none appears to indicate an individual of a particular status either from its special architecture or from objects deposited. Cemeteries do not present any plan or organisa-

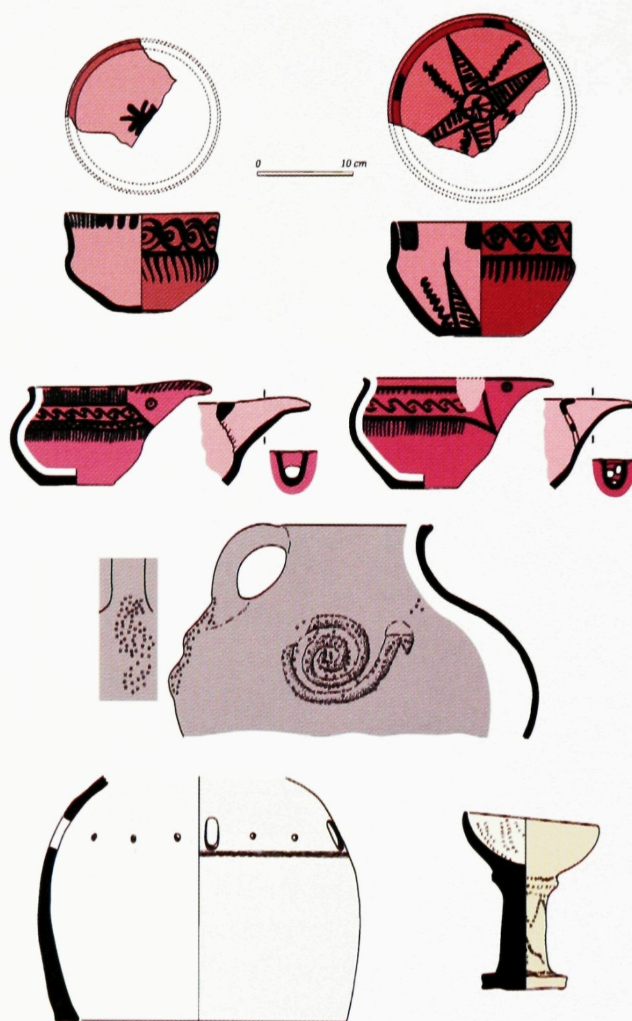


Figure 310 – Various types of Iron Age II vessels found in a pillared building at Rumeilah, Abu Dhabi Emirate. Most of them are painted. They include spouted vessels, pedestalled cups probably used as frankincense burners, a jug decorated with a snake, and a pierced bottomless, vessel that may have been used in measuring the flow of a falaj. Similar vessels were found in various pillared buildings such as those at Muweilah or Bida bint Saud (drawing by Hélène David).



Figure 311 - Vessels with a snake decoration found at Al-Qusais near Dubai, possibly from a ceremonial building (Dubai Museum).

tion that would indicate the centrality of a tomb, even if similar to others, connected to a high-ranking individual with a special status. We must, therefore, probably conclude that status in life, acquired from one's actions or even by birth, was not to be displayed after death, and that at least on this point the people of Iron Age Oman followed the same egalitarian principles as their Early Bronze Age predecessors. These were already so strongly embedded in social life that there was no longer any need for complicated communal rituals to enforce them. A man may have ruled a "palace" like Hili 14 or been recognised by the powerful - and fortunately distant - king of Assyria, and his funeral may have been the occasion for a big celebration, but he entered the afterlife like his kinsfolk. No mausoleum would proclaim to the living community his vanished power to legitimate it for his descendants. There was no need for it and nobody would have accepted it. There was no opportunity for an Arab Ozymandias to grow in power and arrogance and pretend to question travellers in a distant future.

The archaeological record for this period is very rich. Pottery is again an important item, massively produced, and used in large quantities in every household. Similarities can be traced throughout Oman concerning the shape and decoration of the vessels, which are generally covered by a red, brown, black or whitish slip, and bear a decoration of incised geometric patterns on the rim or shoulder, with even the large jars being decorated (fig. 309). The smaller vessels may be painted with various geometric shapes, especially spouted vessels or cups and bowls that may have been used in rituals (fig. 310, 311). Production areas can be detected around the main population centres, and one is located at Hili. They all produced basically the same items, though with local variants. Also each centre produced the special vessels (painted spouted jars and cups or pots decorated with relief snakes) to be used in rituals, a difference from the Early Bronze Age when pottery for special use, mainly funerary, was only produced in few centres. It has also been established that pottery from one centre circulated to other centres where it is found in smaller quantities: objects produced in the Buraimi area, for instance, have been found at Lizq.

No iron objects have been found so far, but copper and bronze metallurgy was still highly developed. Part of its products were deposited in graves



Figure 312 – A set of Iron Age daggers from the Selme hoard near Ibri. The "treasure" was probably the cache of an antique grave robber, as it contained material datable to various periods, although mainly from the Iron Age. (photo German Mining Museum at Bochum).

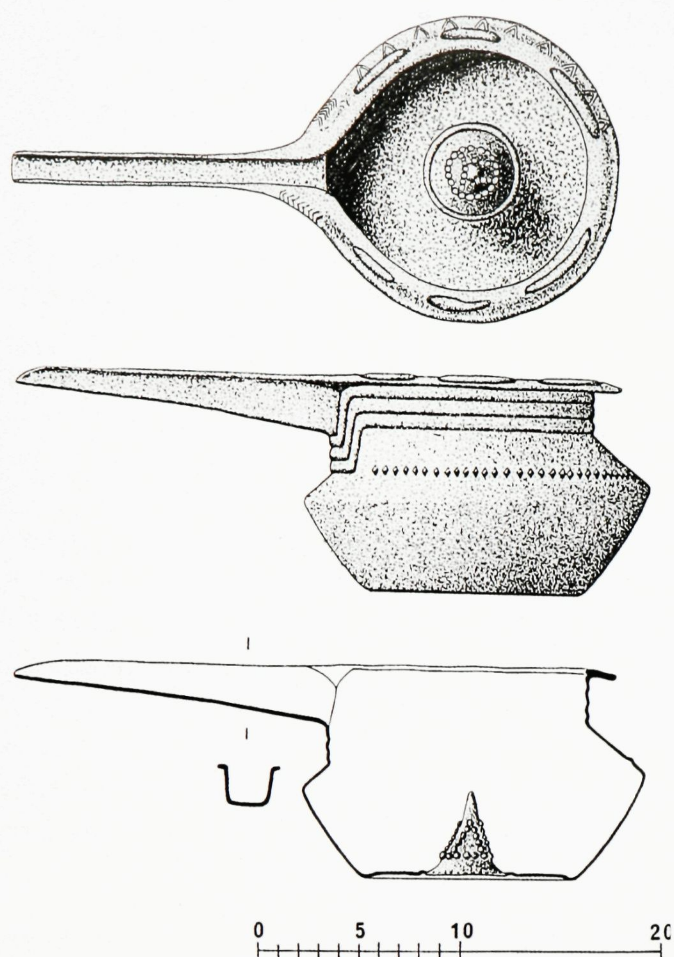


Figure 313 – An Iron Age II copper spouted vessel found at Hili 8. The beautifully incised decoration could only be seen through X-Rays. The similarity to traditional metal pouring vessels of Oman is obvious (Drawing by Philippe Gouin and Hélène David).

and, despite widespread looting, a monument like the grave complex at Baushar still yielded an important amount of material. A hoard of 550 objects found at Selme near Ibri, now in the Department of Excavations and Archaeological Studies, is thought to be the cache of an ancient grave looter (fig. 312, 327, 328 see window 10.2). It was mainly found in an Umm an-Nar type grave that he had re-used for storage. Some objects, notably daggers or arrowheads, continued the styles of Iron Age I. Others belong to new types. Among them are a shaft-hole axe with a large flat cutting edge, often considered as a ceremonial object, similar to many found in graves from Ra's Al-Khaimah to Masirah and also represented on a small contemporary stamp seal found at Rumeilah. One hundred and six massive bracelets and anklets, weighing up to 1 kg, were often decorated with geometric incisions, so too many vessels (fig. 313). These copper vessels, totalling 368, had often been crushed to take up less room, as the looter was not interested in the objects themselves but only in their metal. They present a fairly large variety of shapes, mainly globular open bowls, open bowls with a flat bottom and open rim, and carinated bowls. Some have a long open spout resembling those still produced in traditional Oman for pouring water during formal procedures of hospitality; others have a conical «omphalos» soldered at the bottom of the interior (fig.313). Three scale pans were engraved with fish decoration and a central rosette fig. 314). All the objects analysed have turned out to be bronze alloys, containing 8-12 % of tin.

Some twenty mining sites containing Iron Age pottery, including those already mentioned at Arja, Al-Moyassar, and Raki, have been located by the expedition of the German Mining Museum in Bochum directed by Gerd Weisgerber. It was during the Iron Age that primary copper ores in Oman were exploited for the first time, indicating changes in



Figure 314 – Two decorated copper items found at Selme near Ibri. They are decorated with engraved fishes and stars. The small holes at the end of two perpendicular diameters suggest identification as weighing scale pans (photo German Mining Museum at Bochum).

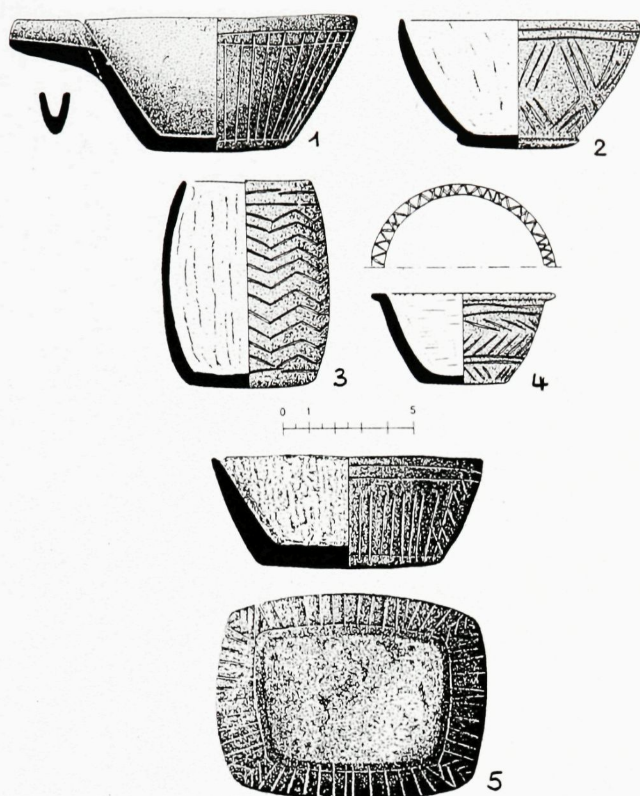


Figure 315:
A selection of various Iron Age Stone vessels (drawing by Philippe Gouin).

smelting technology that allowed for greater production. We have already seen that some objects, like the daggers, are very similar to Iranian types, notably western Iranian ones found in the Luristan graves, and the same is true for arrowheads. It must be remembered that most objects which are supposed to come from Luristan were not legally excavated there and originate instead from antique markets in Iran, Europe, and the USA. Thus they have no certain provenance and many are forgeries. They may originate from Oman as well, from modern looting or, more probably, as objects traded to the first millennium countries of the Near East, where they were later exhumed. We have no cuneiform texts dealing with copper imports for this time, but finds at Bahrain indicate that the trade was again very vigorous in the Gulf, and we may suppose that the former country of Magan continued to export the products of its metallurgy as well as the know-how of its craftsmen.

Soapstone vessels were still produced and deposited in graves. New varieties of a coarser grained stone, medium grey in colour, are now preferred. Dotted circles disappear from the decoration, making way for oblique lines, triangles, cross-hatched areas, and zigzags (fig. 315). The most common shapes include, as before, small bowls with a flat bottom, spouted or not, and conical vessels with a round lid. New shapes include open rectangular basins divided into two compartments and barrel-shaped vessels. And these pieces are even imitated sometimes in grey pottery with similar shapes. Stamp seals with simple geometric decoration, and in one case a human figure holding an axe, are also found. Writing occasionally occurs as graffiti - a few letters scraped on pottery, similar to the South Arabic alphabet of Yemen.

Very little is known about the subsistence economy, but we may be sure that agriculture was widely developed, including the cultivation of palm trees, fruits, cereals, and legumes. Also animal husbandry was probably still well developed in the steppe areas and fishing remained an important resource, as we will see later. There is, however, a notable difference from the Bronze Age periods. The camel is now an important domesticate. When and how this happened remains a matter for discussion, although recent studies tend to confirm that this may have been at the very end of the second millennium BC. The bones found, for instance, in the Iron Age II levels at al-Abraq certainly belong to domestic camels. It may, however, be suspected that this is a distant echo of a domestication that had begun elsewhere, in the steppe areas bordering the desert. Camels allowed the nomadic sections of the population to move deeper, and for longer periods, into the desert, and even to live there permanently, thus strengthening the differences between these groups and those settled in and around the oases. They were also able to move faster and in larger groups, using camel-mounted warriors for raids and wars. In 853 BC, the Assyrian king Salmanazar III defeated a coalition of Syrian rulers using 1000 warriors from Arabia mounted on camels, while around the same time caravans of 200 camels with loads of luxury items, including aromatics, are quoted as reaching the kingdom of Suhu on the middle Euphrates, south of the present border between Syria and Iraq. The presence of camels obviously created new economic and

political relations. They were much more efficient for land trade than the caravan of donkeys mentioned in third millennium sources and made possible much more powerful raiding and fighting parties.

What was the Omani society like 3000 years ago during the first part of the first millennium BC? In many ways it resembled the traditional oases. Leading families may dwell in the forts, while other members of the community lived in extended families in large houses or clearly marked clusters of smaller ones. It still appears to be a kin-based society with strong concern for jural equality. The possible religious importance given, for instance, to the sharing of irrigation water in the rooms of pillars may be a measure of this concern.

The Arabian Sea Coast: Land of the Ichtyophagoi

Many smaller sites must be added to this picture, including several shell-middens in coastal areas, still associated with an intensive harvesting of the marine resources. This exploitation is vividly seen at Ra's Al-Jinz where the remains of several circular structures made of large raised flat stones each divided into several compartments were found near the beach at the foot of the central mesa south of the Early Bronze Age settlement. The excavation of one of these structures showed that they were not dwelling houses but were built for fish storage or processing, similar to the *birkha* used today by Omani fishermen (fig. 316). There was no proper village in this area of Ra's Al-Jinz, but a campsite was established at the foot of the nearby cliff. It is still there, covered by huge stones, several tons in weight, that fell when the whole cliff crumbled (fig. 317). A small sounding between two of these large flat stones uncovered a more than one metre thick layer of debris including fish bones, shells, pottery and even a complete Iron Age soapstone vessel. We may interpret this as a seasonal campsite that continued the long tradition already observed at Ra's Al-Jinz. Another campsite of the same period, hidden from the sea by a rock crest, was located on the lowest slopes of the nearby hills of Jabal Salim Khamis.



Figure 316 - A fish curing structure of Iron Age date at Ra's Al-Jinz RJ-2b. It is rather similar to the traditional Birka of Omani fishermen (photo Joint Hadd Project)



Figure 317: Iron Age settlement at Ra's Al-Jinz RJ-33. The structures in foreground are birka similar to that of fig. 316. The proper settlement was at the foot of a cliff that collapsed over it at an unknown time and covered its remains, which are now well preserved ... under massive stone slabs (photo Joint Hadd Project)

Several Iron Age sites have also been discovered in the Ra's Al-Hadd area. Some are located near the sea or the Khor Al-Hajar lagoon; but the most interesting is site HD-21, located some hundred metres south of the lagoon, hidden from the view in a shallow depression on a rocky plateau. Over a dozen stone-built houses are scattered across some four hectares, controlling the sea but hidden from it. One of these houses was partly excavated. It was made of several rectangular rooms and had been resettled several times. The pottery indicates long occupation, possibly down to the last centuries of the first millennium BC. This is also the case with a small group of cairn burials at HD-9, where, apart from local ware (i.e. made somewhere in Oman but certainly not in the Ra's Al-Hadd area), some pottery of Indian origin was found, an indication that trade along and across the Arabian Sea was still active, as were exchanges with the interior. The scanty remains of a building with typical Iron Age II pottery were found at site HD-60 and small groups of Iron Age cairns among the larger Hafit type cemeteries at Al-Aïn and Mellahi. Even a small cup of typically Persian affinity, produced in Oman or imported from Iran, was found at a small coastal site near the outlet Wadi Al-Batha in the sea. It can be seen as a distant echo of how Persian power in northern Oman also reached the area.

Iron Age shell middens are also known throughout the coastal areas of Masirah, with a concentration in the bay of Sur Masirah and at Ra's Mirsin. Cemeteries of cairns and subterranean tombs have been found in various areas. The pottery resembles that of Lizq and all the distinctive types of this period are present, including pots with appliqué snakes and painted bowls that may have been linked to a special function. A shaft-hole axe, a hoe, and arrowheads of bronze similar to those known from northern Oman, were also recovered, but there are indications that also flint tools continued in use. The island seems as populated at this time as it was in the early second millennium BC.

In Dhofar, the Transarabian Expedition led by Juris Zarins has uncovered a large number of Iron Age sites which will be described in our next chapter. To ancient Greek and Latin writers this westernmost part of the Indian Ocean, from the Horn of Africa to India, was known as the Erythrean Sea and the area along the Arabian and Makran coast was coined the land of the fish-eaters (Ichtyophagoi) (fig. 318) (window 10.3). They emphasise the complete dependency of its inhabitants on the sea, the particularly tough conditions of their lives, and the absence of wine, oil, and any comforts associated with civilisation. Seen from the land, however, the



Figure 318:
The old village at Sharbitat, Dhofar. It gives an idea of what Iron Age fishing villages along the Arabian Sea coast (the Ichtyophagoi of classical written sources) would have looked like. That same way of life lasted until the 1970s, unchanged for at least four millennia (photo Joint Hadd Project).

coastal area can be considered as an ecological zone rich in food and other resources. A major aspect of the local economy was certainly the intensive processing of these resources far beyond the requirements of daily subsistence, especially for deferred consumption during monsoon times when fishing becomes difficult and for export to the interior where they were in great demand. This may even have misled the mariners and ancient geographers coming from the Mediterranean world. Like the people of Ra's Al-Jinz in the third millennium BC, the fish-eaters of the late first millennium BC were not a separate stock, but closely linked to the people of the interior by cultural and economic ties. Materials found on Masirah are a good indication of this. The Greek scholar Agatharchides of Cnidos, who lived in Alexandria, the most civilised city of those times, describes them as having "neither cities nor territories nor any trace of technical skills"; but, as modern archaeologists, we consider that these coastal people had long since reached a high level of adaptation and efficiency in the exploitation of their harsh environment. They had close contacts with the communities of the interior, even if the barren mountains and deserts that form their immediate background appear to suggest a world in almost complete isolation. Mail and milk delivery was not daily, but communications did exist and were carefully maintained. Life was hard for everyone. For these geographers and travellers who came from the centres of power in the Mediterranean world, however, the *Ichtyophagoi* appeared to be people living the poorest life one could imagine, far from everything, scattered along the shores of the peripheral ocean, at the true ends of the earth.



Figure 319 – Iron Age III houses at Rumeilah (ca. 600-400 BC). In these houses was found pottery made in imitation of Iranian Achemenian pottery, or even imported from Iran, together with a copper arrowhead similar to those used in the Achemenian armies (photo French Archaeological Mission to Abu Dhabi).

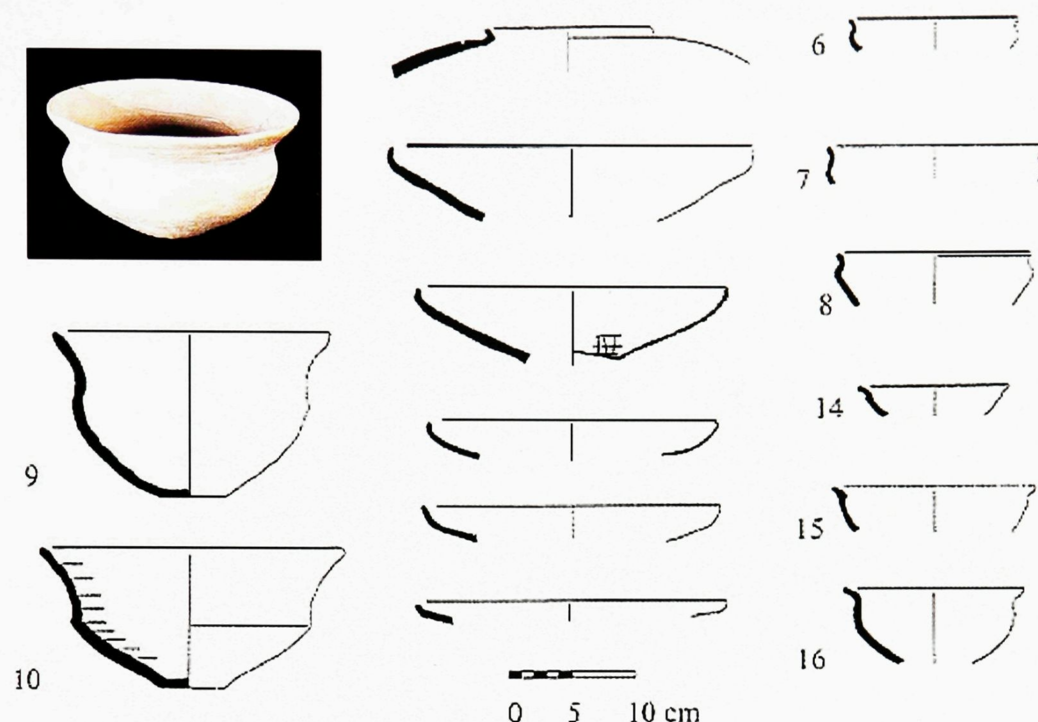


Figure 320 – Iron Age III pottery, mainly from Rumeilah. The shapes and fabric are very similar to those of the Achemenian Period in Iran, from where some may even have been imported. Such pottery is found all over Oman, as far as Khor Bani bu Ali in eastern Ja'alan (after Benoist 2001).

Towards History.

In 550 BC, King Cyrus the Great, whose family had already ruled the Persians for generations, founded in his capital at Pasagardae near Shiraz the Achemenian Empire, which he thought was destined to rule over the entire universe. Although this ambitious goal was never reached, his "Universal Empire" was to remain for two centuries the most powerful on earth, until its new capital at Persepolis was conquered by Alexander the Great in 332 BC. All the countries from Turkey to south-western Central Asia, the entire Near East and Egypt, were subdued by conquest, the process being completed by his followers Cambyses and Darius. The latter, in a long inscription on the rock of Behistun, mentions among his possessions the country of *Makkash* situated along one of the main routes linking the Iranian plateau to Mesopotamia. This land is often quoted in later texts as an administrative province of the empire, and its inhabitants, the Macyia, appear on various official monuments as bare- headed and wearing a loin cloth and short sword. A Satrap (governor) of *Makkash* also appears in some inscriptions. This domination of Oman by Persian rulers finds echoes in the Omani legend of the *Kashf al-Ghumma* that relates the fight of the Azd Arabs against the Persian rulers of Oman. The date of the beginning of Persian rule in Oman, and even its nature, is highly conjectural, but changes start to appear in the Iron Age settlements of northern Oman after 600 BC. These changes are difficult to see as many sites continued with little transformation. But some new types of pottery appear, notably highly burnished cups of a dark reddish brown ware, very similar in fabric and shape to eastern and southern Iranian models (fig. 320). Some was probably imported, as were two copper arrowheads of the type used by the Achemenian armies, which were found at Rumeilah (fig. 319). Some pottery belonging to these new types has been found at Bahla BB-15, Al-Moyassar, in the graves of Baushar, and even



Figure 321 – Mleiha (Sharjah Emirate). Fortified residence of a local ruler of the 3rd-4th centuries AD. The Sharjah authorities have agreed to divert the modern highway around the site, a rare victory for archaeologists! (French Archaeological Mission to the United Arab Emirates).

in more distant Ja'alan. Some sites were abandoned, like Muwailah or Lizq, and new ones were settled, but this cannot be directly related to a Persian conquest. It seems, on the contrary, that life continued on its way despite the presence of foreign overlords or the fact that local tribe leaders ruled in the name of a foreign power.

New and profound changes appear around 300 BC, after the fall of the Achemenian Empire. Cyrus's territories were first dominated by Greek rulers who split the ephemeral empire of Alexander the Great, the Seleucid dynasty in Mesopotamia, and Iran. These later became the stakes in a long competition between Persian dynasties in the East (Parthians, 100 BC-250 AD followed by Sasanians, 250-650 AD) and the Roman Empire that ruled the entire Mediterranean world as far as southern Egypt and the Euphrates valley in Syria. The Romans never controlled more than the rich trading tribes of the northern part of Arabia, the Palmyrenians and Nabateans, and the Red Sea trade through ports and outposts along the Egyptian coast of the Red Sea. They once sent an expedition under General Aelius Gallus that had to withdraw quickly from Yemen in 25 BC. The partly iranised Greek Seleucid dynasty, followed by the Parthians and the Sasanians, always kept control of the Gulf through various strategies, more or less intervening in local affairs. The most active were probably the Sasanians who, from 570 AD to the Islamic conversion, launched expeditions as far as Yemen. This new period is known as the Samad period in Oman and the Late Pre-Islamic period in the United Arab Emirates, where it was mainly identified at Mleiha and ed-Dur. Some authors have linked it to the arrival of new populations from western Arabia, but others tend to disagree, or at least to minimise the role of the newcomers in the population, even if they could have precipitated marked cultural changes. The oasis areas were still settled. A place like Al-Moyassar in Wadi Samad, where signs of this period were first noticed in Oman, displays indisputable evidence for a general cultural and economic continuity: the same falaj, for instance, is still used. Earlier houses are often reoccupied or new ones built in a rather similar way. On the other hand, many areas only display the remains of postholes from flimsy houses, a probable sign that a growing part of the population may have turned to a more mobile way of life. Large quadrangular fortresses are also known from these areas, for instance at Mleiha (fig. 321).



Figure 322 – Mleiha: mould for the production of copper coins in imitation of Alexander's tetradrachm found in the fort. Alexander's tetradrachm was the main coin used in Arabia at that time, similar to the use of Maria-Theresa thalers until recent times (French Archaeological Mission to the United Arab Emirates).

The region, however, experienced deep cultural changes in its material culture. Iron is now the dominant metal for making tools and weapons; glazed pottery, blue or brown, appears during this period, and glass vessels are imported. Generally speaking, trade flourishes, both with the Near Eastern and the Mediterranean world through the Gulf, and with the Indian world across the Arabian Sea. The use of coins is introduced from the Greek world and local rulers start to mint their own in imitation of the famous tetradrachms of Alexander the Great (fig. 322). Items of this trade include all the luxuries of the time, like small glass vessels of eastern Mediterranean origin or Greek wine from the Island of Rhodes. Several Rhodian wine amphorae were found in a cemetery at Mleiha (fig. 324), while red polished ware of Indian origin is known at ed-Dur. Contacts with the rest of Arabia, and notably Yemen, are more abundant than in the Iron Age. Small boxes of alabaster or copper vessels decorated with mythological scenes have been found at sites like Mleiha and ed-Dur in the Emirates and at Al-Moyassar in Oman. Camels seem to have been widely used and to have finally reached the status of an important animal, as camel graves are found together with human burials at Bat, Samad, Mleiha, ed-Dur, and many other places. Such a custom is



Figure 323:
Samad ash-Shan: two bronze rython heads in the shape of horses, Samad period, ca. 400-100 BC. Such drinking vessels are well known from Iraq to Central Asia and are very characteristic of the Parthian Empire (photo German Mining Museum at Bochum).

also known from other regions in Arabia including Yemen. In some cases an iron sword was found inside the burial, suggesting that the animal was probably slaughtered to accompany its rider in the afterlife. There are indications that horses were used as well, and the beautiful bronze cast figure of a horse, probably part of a ritual vessel, was found in a grave at Al-Moyassar. Drinking horns (rhytons) ending in the shape of a horse's head were a favoured item for rituals and banquets during the Parthian Empire (fig. 323).

Thousands of graves from this period have been found. In Oman, at Al-Moyassar for instance, most are underground stone-lined pits and are quite richly provided with pottery, jewellery, and weapons, including luxuries of foreign origin already mentioned. Re-use of earlier graves, such as Iron Age or even Early Bronze Age cairn burials, or Wadi Suq collective burials, is also common. At Mleiha were also discovered well-built chambers made of stones or mud-bricks that appeared to have been topped by a square tower, an obvious indication of links with north-western Arabia where this type of monument originates (fig. 324). They were obviously a way to display differences in wealth or social rank among the individuals buried in the same group, and, as at Maysar, the contents also show such marked differences. At ed-Dur a funerary temple was surrounded by many graves, suggesting a *kubba*-type of cemetery that still survives in some parts of Arabia. If one excludes the particular case of Asimah, around 2000 BC, this is probably the first time that we can see such a display of individual status in a burial and it partly matches what is known about the new way of life. Whoever could mint money in his fortified palace at Mleiha was at the head of an economic power previously unrecorded. But the organisation of the graves around a funerary temple, probably devoted to an important real or mythical ancestor, also reminds us that the old kin solidarity is still alive and well. ❑



Figure 324 – Mleiha (Sharjah Emirate): The base of square tower tombs made of baked bricks, 3rd-2nd centuries AD (French Archaeological Mission to the United Arab Emirates).

Window 10.1
Iron Age Buildings with a Pillared Room in Oman.
By Anne Benoist.

At the Iron Age II settlements of Rumeilah, Bida bint Sa'ud, Muwailah, and Bitnah-B in the United Arab Emirates, recent excavations have revealed a particular type of building probably related to the administration of water in the oases of that time. These are medium-sized buildings, mainly comprising a large room covered with a flat roof supported by several rows of wooden pillars. The base of these pillars consists of a large stone slab surrounded by a low wall of mud-brick masonry. Three rows of three pillars were found at Rumeilah, three rows of four pillars at Bida bint Sa'ud, and four rows of five pillars at Muwailah. Smaller rooms were distributed along one or two sides or the main hall (fig. 325). The floors and walls of the building at Rumailah were covered with a thick white plaster. A similar plaster was found at Muwailah, while at Bitnah the floor was paved with large slabs. At Rumeilah and Bida bint Sa'ud, large oval pits carefully lined with stones or mud-bricks were uncovered around the building. They were filled with sand and ashes and at Rumeilah small square hearths were associated with them.

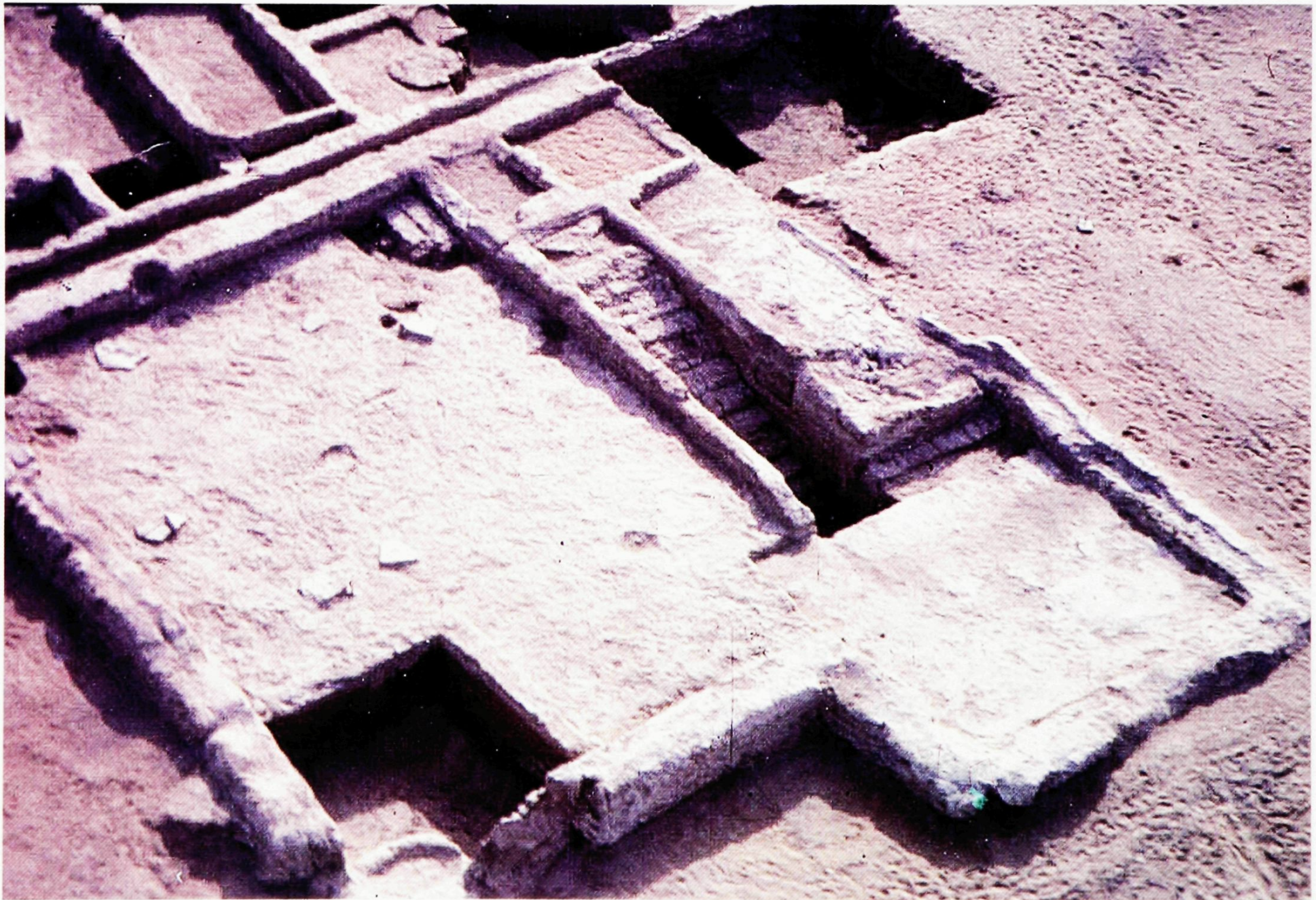


Figure 325:
The pillared building at Rumeilah was preserved up to its roof (photo French Archaeological Mission to Abu Dhabi)

These buildings were also provided with particular kinds of pottery and other objects. Among them was pottery decorated with applied cordons representing snakes. Fragments of similar vessels are also known from BB-15, near Bahla, and from Am-Dhurra in Wadi Aghda (Sharqiyah), where the remains of large buildings can be seen from the surface. A large number of bronze snakes were also uncovered in a badly destroyed building of the same period at Al-Qusais near Dubai. Snakes often played an important role in the religious and mythic beliefs of the Middle East. In Mesopotamia and Elam they are a well-known symbol of fertility, often represented in association with flows of sweet water. In Bahrain, snakes were the object of a particular worship and numerous snake skeletons were uncovered below the floor of religious buildings, coiled in bowls around a pearl or a turquoise fragment. Other items found in these buildings include painted bowls and spouted jars, often called "teapots" by the archaeologists. This is an obvious anachronism, but they were certainly used for pouring a liquid, and the frequent presence of a strainer inside the spout suggests that this liquid may have been a kind of wine. Small cups on a pedestal containing a dark burnt deposit are very probably incense burners. All these items were possibly part of the paraphernalia involved in rituals that took place in these particular buildings.

Another special type of pottery was found at Rumailah, Bida bint Sa'ud, and Bitnah. These are large cylindrical vessels open at both ends, with a row of rectangular and circular perforations below the upper rim. Their shape strongly recalls that of traditional items used by oasis communities to measure the amount of water sent into different branches of the irrigation system (according to location, such items are variously called chegfa, tasa, gadous or mechkoudas). The measuring of water is usually public and performed by an official accredited by the falaj community, which also keeps the measuring device when not in use.

At Bida bint Sa'ud the outcome of a falaj was discovered accidentally 100 m to the south of the building. At Rumeilah no falaj was discovered during excavations, but the building with wooden pillars is located in the eastern part of the settlement, which is the most likely place for a falaj outcome. Thus, these two buildings were remarkably well situated to control the distribution of water in the irrigation system. A similar situation is possible at Muwailah and Bitnah. The pillared buildings therefore appear to be communal houses, both associated with an important economic and social activity – the sharing of water – and with rituals, connected to underground waters that bring fertility to the oases and prosperity to the whole community. They represent a fascinating insight into the daily life of Iron Age oases in Oman. ❑

Window 10.2

Iron Age Mining and Smelting (Lizq Period)

By Gerd Weisgerber

Beginning at least during the 13th century BC, major production of copper restarted in Oman. It seems that the Cyprus double-step chalcopyrite smelting technique had also arrived here as it had elsewhere during the same time (for instance in the European Alps). Copper production continued or restarted on a really large scale. There are no large medieval smelting facilities which have no predecessor in the Iron Age. These smelters are always situated near the ore body but never as close as in medieval times. Now the smelting debris results in large tapped slag cakes of up to 10 kg, easily distinguishable from the smaller Bronze Age waste. Fragments of the furnaces only were found at Wadi Qatif. Excavations at Raki 2 near Yanqul revealed a large settlement site with a long period of copper production, from 1200 to 800 BC. So much slag was produced that people started to use slag cakes as building material. They were used like stone slabs for the construction of the walls of the houses. These often were built on top of slag piles, and the new slag was dumped against the walls. As a further step, new houses were positioned on that dump. Until today the largest and highest slag heap of the 1st millennium BC lies at Raki 2 beside Wadi Raki, which has heavily eroded part of it, though 4 m of it remain. At Semdah or Lasail the Iron Age slag heaps cover areas near the entrance of the sites (fig. 326).



Figure 326 – Iron Age slag heap at Lasail West 1A (photo German Mining Museum at Bochum).



Figure 327 – Iron Age copper weapons from the Warrior Grave at Nizwa (daggers) and from excavations in Bahla fort (arrowheads), as displayed in the exhibition that was held during the Magan Conference at the Intercontinental Hotel, Muscat, in April 2004.

At Wadi Miadin, an unusually strong building of that period controls the mining and smelting areas.

This is not surprising because the Iron Age was the time fortresses were built all over Oman. Village life was based on falaj irrigation and almost no Omani village of today depending on falaj irrigation is without a Lizq-time fortress on its periphery. But in smelting places fortresses seem to be rare. The stone-built hut-tombs typical of that period have often survived near smelting sites, and the largest cemeteries ever seen are found near Jebel Saleli, Bilad Al Ma'aidin, and Mullaq. These tombs more often reveal Iron Age copper production than habitation remains which survived much less and often might be eroded beyond recognition.

After the first half of the 1st millennium BC, copper production in Oman seemed to be interrupted for a while. According to present-day knowledge, a gap of 1000 years seems possible. But the possibility of Parthian and Sassanian exploitation should not be ruled out before early Islamic copper production started in the 8th century AD. ❑

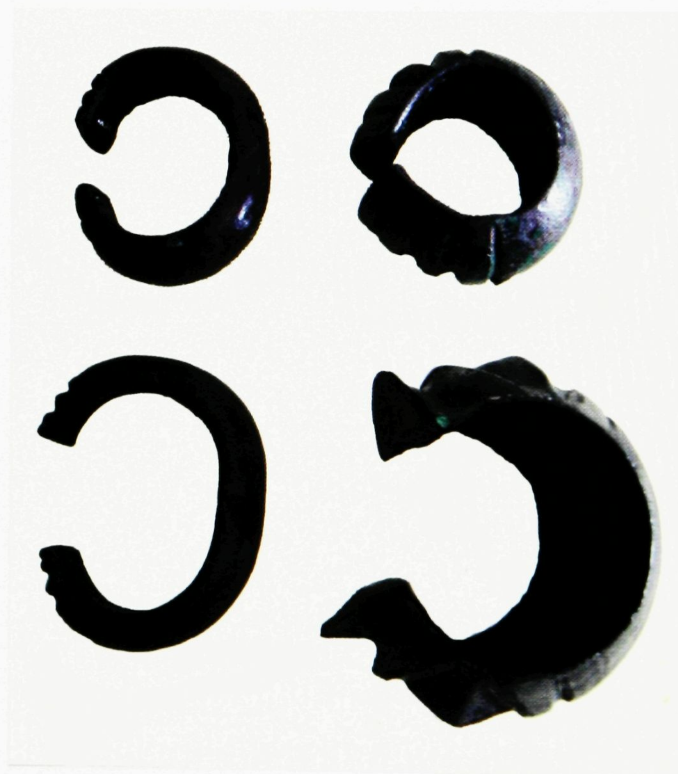


Figure 328 – Bronze bracelets or ankle rings from the Selme hoard (photo German Mining at Bochum).

Window 10.3
The Fish-Eaters (Ichthyophagoi)
By Oscar Nalesini

In the winter of 325-324 BC, ships belonging to the army that had conquered the Achaemenid Empire under the leadership of Alexander the Great crossed the Indian Ocean to explore the sea-lane from India to Babylonia. The expedition's log, written by Nearchos of Crete, admiral of the Macedonian fleet, contained a detailed description of the sea-coast inhabitants of the Gulf of Oman, called Fish-Eaters (Greek Ichthyophagoi) after their way of life. This was not the first time that this ethnonym had appeared in Greek literature. It had formerly been mentioned in Egyptian history of the 6th century BC, namely by Clearchos of Soli, who was searching for the Nile's sources on behalf of the Pharaoh Psammetichus, and by Herodotus in the story of the Achaemenid king Cambyses, who entrusted some Fish-Eaters to spy at the Nubian court because of their knowledge of the local language.

This name, however, became widely used in Greek geographical literature only when Alexander the Great's conquest of the Persian empire brought direct knowledge of the Red Sea and Indian Ocean (or Erythraean Sea, as it was called in Greek). As a consequence of the new maritime explorations, mostly sponsored by the Lagid rulers of Egypt to discover the sea-lane to the ancient land of Pwnt and its exotic goods, the Fish-Eaters became known as one, and possibly the largest, of the four main divisions of mankind inhabiting the tropical regions, for they lived on the whole coast of the Outer Ocean, as believed by the Alexandria-based scholar Agatharchides of Cnidus in the 2nd century BC, and some decades later by the Syrian-born historian Poseidonius of Apamaea.

The strange way of life followed by those oceanic fishermen surprised the Greeks. In Nearchos' words: "these Fish Eaters live on fish, hence their name; only a few of them are active in fishing, as only a few have made boats for the purpose and acquire any skill in the art of catching fish but for the most part the receding tide supplies them. They have nets made for this purpose mostly about two stades [about 360 m.] in length. They plait them from the bark of the date-palm, twisting the bark like twine. And when the sea recedes and exposes the land, the fish are not found as a rule where the earth is left dry, but where there are hollows some water is left, containing a very large number of fish, mostly small, but some large ones too, which they catch by throwing nets over them."

Besides fishing, the whole daily life of the Fish-Eaters, as described in Greek literature, looked equally primitive. They lived in small poor villages, whose houses were built with the bones of beached whales or mangrove wood. In some cases the houses were covered with fish-bones or sea-weed; in others they were dug into the coastal sandstone cliffs, as at the RJ-33 Iron Age site discovered at Ra's Al-Jinz. Moreover, the Fish-Eaters walked around naked or wore sea-animals' skins, ate only raw fish (sometimes pounded into a sort of flour with a mortar made from whale vertebrae), had wooden spears or harpoons with fire-hardened tips, and knives made of sharpened flints.

Generally speaking, they were not only short-lived, miserable, and completely isolated from the outside world, but also lacked any technical skills and were ignorant of moral qualities or social values, though it was believed that they enjoyed plenty of food and good health because of their simple life and possessed an instinctive knowledge of pleasure and pain. It is therefore hardly surprising that in the Hellenist perception the Fish-Eaters ranked among the most savage of men.

The strong ideological bias underlying these scholarly opinions originated from the belief that the Erythraean Sea was but a portion of the ocean surrounding the globe, whose coasts became the edges

of the inhabited world where the Greeks had located fantastic and monstrous people since the age of Homer and Hesiod.

Growing evidence for the importance of these coastal people in the origins and development of Indian Ocean navigation since prehistory, made available today by archaeological research throughout Arabia, supports a different reading of Greek and Roman texts on the Fish-Eaters. Indeed, some passages of those same Greek sources illustrate a quite different social and economic reality. In a settlement called Balara, the Fish Eaters not only had gardens and fruits, but also grew flowers to make garlands. Balara was also a harbour, because Nearchos met there a pilot able to guide the Greek fleet up to the Strait of Hormuz. Further west the Greeks encountered a walled city inhabited by Fish-Eaters, who offered Nearchos fish baked in earthen pans. The city's defences were strong and the Macedonian soldiers could only capture it by using trickery. We also know that the Fish Eaters produced fish-oil, until recently a basic ingredient of wooden ships' caulking, while the presence of an expert pilot, good harbours, and a walled town on the coast of Oman point out to an existing network of maritime activities involving the Fish-Eaters too. In the Red Sea, the Fish-Eaters of the Dahlak islands were also known as providers of the tortoise shells sold in the important market of Adulis to the traders of the Roman empire.

But for Arabia the most important commercial venture in which the Fish-Eaters were directly involved was the frankincense trade. This is explicitly verified by Artemidorus of Ephesus in a passage of his Geography, where he reported that myrrh was gathered in the territory of a small town on the African side of the Strait of Bab El-Mandeb inhabited by Fish-Eaters. Moreover, according to the 1st century AD anonymous text Periplous of the Erythraean Sea, the Fish-Eaters of Masirah island were holy, and one wonders whether this status reflected their participation in the trade of the gods' scent gathered in Dhofar.

To further clarify how complex the culture of the Fish-Eaters was, one has to focus attention on a myth the Makran Fish-Eaters told Nearchus about their origins. The tale is set on the island of Asthola (or Nosala in the Fish-Eaters' tongue), where a sea-deity (identified as a Nereid) used to transform into fish any sailors approaching the shore. This continued until the sun intervened, and in the end the Nereid turned the fish back into humans, from whom the Fish-Eaters descend.

Today we understand that this myth, originating in prehistory, expresses a deeply rooted eschatological belief of the coastal people of the Gulf of Oman. This historical relationship becomes more intelligible once the myth is set against the backdrop of the deposition of sea-turtles along with bodies in the 4th millennium BC graveyard of Ra's Al-Hamra. This funerary ritual underlines a special religious link between the people and this sea-animal, the turtle not only enjoying a long life, but also being one of the few creatures able to cross the thin though substantial border between the land and the underwater realm, as the forefathers of the Fish-Eaters did in their mythic past. ❑

Chapter 11

Dhofar: Land of Frankincense

Chapter 11
Dhofar: Land of Frankincense

Dhofar, though separated from northern Oman by vast barren areas, shares various similarities with it that date back at least to the 6th millennium BC. However, its special climatic conditions, principally due to the *kharif*, the summer monsoon rains, and the presence of a particular resource, frankincense, have led to the development of rather different cultures.



Figure 329 – Cows grazing on the Jebel after the summer monsoon, with the ocean as a background; a picture that nobody would expect to see in Arabia! This alone explains the very particular cultural development of Dhofar. (photo Serge Cleuziou).

The Dhofar region can broadly be divided into four ecological zones, each with its own distinctive characteristics: the coastal plain, the hills, the Nejd, and the desert. The coastal plain centred on modern Salalah is about 50 km in length and no more than ten kilometres wide. Wadi flows are rare, with some exceptions such as Wadi Arzat and Wadi Darbat, and the most favourable environment for human communities have been the small khawrs or inlets opening along the coast, where mangroves often grow, providing a biotope rich in potential resources. The hills rise abruptly to the north to an elevation of between 300-400 m above the plain and reach a peak elevation of 800 m, forming a forty kilometres wide plateau cut by the deep valleys of several wadis. These limestone formations have numerous caves and sinks. The vegetation on the southern portion of the plateau, favoured by the summer monsoon, consists of trees and dense shrubs (fig. 329) and gives way northwards to grassland and eventually to a barren scrub steppe. The jabal itself begins to the east in the area of Hasek (Jabal Samhan) and stretches west to the end of Jabal Qamar, in Yemen (fig. 330). Only its central part



Figure 330 – The massive escarpment of Jebel Samhan overlooking the narrow coastal plain at Hasek. In the foreground is a 4th millennium fishing site (photo Joint Hadd Project).



Figure 331: The Nejd valleys between the green mountains and the desert (photo Serge Cleuziou)

receives the full blessing of the *kharif*. Further north begins the Nejd, a dissected tableland that progressively turns into a gentle, undulating plain (fig. 331). Here begin the major wadis (Dawkah, Ribkhut, Dhahabun, Ghadun). Vegetation is confined to shrubs and grasses. Frankincense trees (*Boswellia sacra*) grow in the southern portion of this zone (fig. 332). Beyond the *Nejd* extend the sands of the Rub' Al-Khali, the great Arabian desert, with its large dunes reaching a height of over 200 m. It should be remembered, however, that these are of quite recent formation, and that up to about 10,000 years ago, during the early Holocene, water draining from the highlands ended here in lakes that allowed life for many plants and animals and good opportunities for human communities as well.



Figure 332 – Frankincense trees in Wadi Adunib (photo Serge Cleuziou).

These four zones are closely packed within an area less than 150 km from south to north and are linked by the major climatic phenomenon of the summer monsoon (June-September). Today its effects are felt only on the coastal plain, the Dhofar Hills, and to a lesser extent in the southern Nejd from Jabal Samhan to Jabal Qamar; but the study of ancient climatic conditions has indicated that some 10,000 years ago they covered a much wider area, with a direct influence on the distribution of animals and plants, in particular the frankincense trees. Although also aimed at understanding cultural evolution in the area, most work done by archaeologists in Dhofar has been directed at reconstructing aspects of the ancient frankincense trade. For long this has been overshadowed by the famous site of Khor Rori, ancient *Sumhuram*, founded in the first century AD to control the trade for the benefit of the powerful kingdom of Hadramawt, but archaeology is now able to narrate a more entangled and much older story.

Hunter-gatherers in Dhofar

Scatters of Palaeolithic tools have recently been found all along the Nejd escarpments, confirming what was discussed in chapters 2 and 3. Most belong to the Middle Pleistocene, while the oldest may be earlier, dating from around a million years ago. No doubt the present barren areas of northern Dhofar and the Harassis will yield many more sites, but their interpretation will remain very difficult and, as usual, disappointing. It would be very different if, as in East Africa, the fossilised remains of early man could be found here. This may be mainly a question of time; but, as long as it has not happened, our human palaeontology colleagues will have difficulty in convincing their funding institutions to invest money in further research work. It must, however, be remembered that the fossilised remains of 36 million year old small creatures that can be placed on the long evolutionary path leading across a million years to simians and hominids have been found near Taqa. But that is another story.

Because of its particular relief, and its many dissected sedimentary terraces, caves, and rock shelters, Dhofar is a very promising area for prehistoric research. At present, the earliest known sites date from ca. 9000 BC at Habarut on the Yemen border. These sites belonged to bands of hunters who roamed all over the area, from the Rub' Al-Khali lakeshores of the humid period that started around that date to the coastal plains. Among the most distinctive objects of this period are the Fasad points, thus named because they were first found in the Ramlat Fasad. These were used as spearheads by



Figure 333: Neolithic flints (5th-4th millennium BC) from Ibn Hamuda (after Zarins 2001)

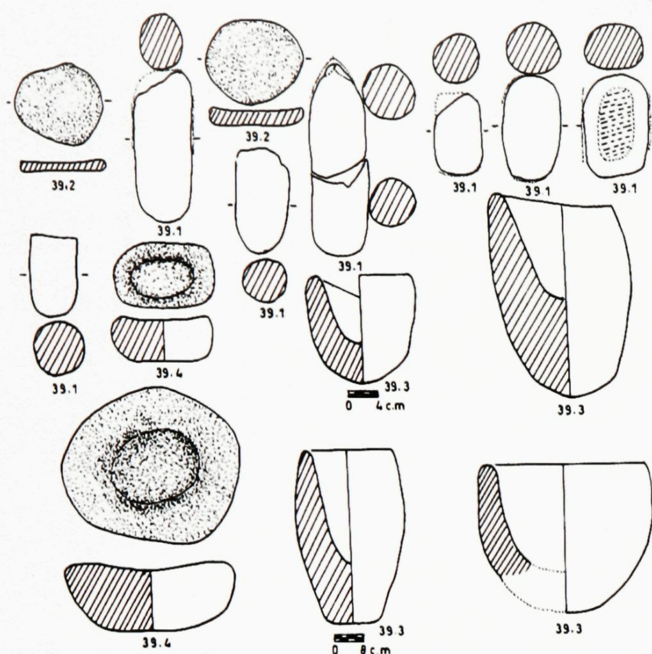


Figure 334 – Ground stone Neolithic grinders and pounders from Ibn Hamuda (after Zarins 2001)

hunters, whose campsites have mainly been found throughout the Nejd, notably around the permanent spring at Shisur. But they are also found up in northern Oman, in particular in the 7th to 5th millennium BC sites of the Ja'alan. Later, during the 5th and 4th millennium BC, many sites appear to have been settled with circular houses built on a stone base, where large sandstone grinders and slabs, limestone mortars, pounders, and large vessels and bowls are occasionally found, one example being at Ibn Hamuda in the Rub' Al-Khali sands near the Yemen border (fig. 333, 334). The flint tools found at these sites belong to a variety known all over the southern part of the Arabian peninsula, from Qatar to Yemen, and are usually called Rub' Al-Khali Neolithic (or Arabian bifacial). At Zebrit, a late 5th millennium tomb yielded a slate palette, a large grinding basin, and a finely retouched stemmed flint point of triangular section (fig. 333 n.39h and i). Similar points are known from the Ja'alan to the Hadramawt and indicate a certain cultural community. At SWY-1 in the

Figure 335 – These remnants of greenery in Wadi Andhur were exploited by foragers during the Neolithic Period (photo Transarabian expedition / Juris Zarins).



Figure 336 – A possibly 4th millennium fishing camp with round huts on a stone base near Ra's Nus (photo Joint Hadd Project).

Ja'alan they seem to characterise both the 5th and early 4th millennium BC. The exchange of various kinds of goods across rather large distances is already evident. These include sea-shells from the coastal areas, such as beads of *Engina mendicaria*, but also obsidian. This dark or green natural volcanic glass can be flaked like flint and transformed into very sharp tools. A number of fragments and small blades of obsidian from Matafah in Wadi Ghadun have been analysed and shown to originate from the area of Dhamar in Yemen, as probably did seven obsidian beads found in a 5th millennium tomb at Khor in north-eastern Qatar. It is very likely that frankincense, which was certainly known and used by the early populations of Dhofar, already followed the same exchange circuits at this early stage to reach the shores of the Gulf and the Red Sea.

Some coastal sites, mainly shell middens on the edge of ancient khawrs in the Salalah plain, can also be dated to this period. Reconnaissance carried out east of Mirbat has identified several sites near Hasek (fig. 336). These can be dated to the 4th millennium BC and display the same kind of stone tools as those found at Ra's Al-Hamra or in the Ja'alan. They were settled by fishermen who, as in northern Oman, did not hesitate to sail on the high seas. Direct evidence is offered by the discovery of contemporary sites in the Hallaniyat Islands. Although the islands are devoid of any flint source, flint tools were found there, probably imported from the Hasek area just across the sea, where such sources are abundant. The Hallaniyat Islands are well known as a very important nesting ground for birds and one may entertain the idea that coastal fishermen seasonally visited them to collect eggs and hunt birds in winter when the sea was not too rough for their fragile boats.

While northern Oman during the 4th millennium BC experienced the drastic social and political changes described in chapter 4, Dhofar seems to

have remained for a longer period of time under less complex economic and social conditions that may have lasted until the second part of the 3rd millennium BC. Flint tools, including the finely made arrowheads with triangular section, remained in exclusive use. Whether, during this period, frankincense was already traded towards the urban centres of Mesopotamia remains a matter of discussion among specialists. We know from the earliest cuneiform texts, dating from the very end of the 4th millennium BC, that various aromatics were used during religious or official performances; but it remains unclear whether the material mentioned in these texts, which are still very difficult to interpret, was really frankincense from *Boswellia sacra*. Later on, the Sumerian term IM.GIG (Akkadian *kanaktum*), currently translated as "frankincense", occurs for the first time in a text from the southern Sumerian city of Lagash, around 2400 BC.

The Bronze Age in Dhofar

This first unambiguous mention of frankincense in Mesopotamia comes shortly before the first physical evidence for its use outside Dhofar in the shape of an incense burner from the northern compound of houses at Ra's Al-Jinz. It has already been stressed in chapter 8 that frankincense was in no way an exceptional commodity on the site, and it may be assumed that the *mabkhara* of Ra's Al-Jinz is only the first known example of objects already in common use in Oman. This indicates that a frankincense trade route along the south-eastern coast of Arabia was already active, through which the coveted aromatics may have reached Mesopotamia and possibly the Indus valley, along with copper and other items of Omani origin.

In the same period, cultural changes are also documented in Dhofar. By contrast with our knowledge of northern Oman, the Bronze Age here is still poorly documented, but at least we know that it did exist. Several late third millennium BC sites have been located along the coastal lagoons east and west of Salalah. These, like earlier shell middens left by people exploiting the rich biomass of the mangrove swamps, were characterised by particular types of flint tools and by a general lack of pottery. Similar sites were found in the area of Mughsayl. On the promontories overlooking the sea at the entrance of Khor Rori, inland on terraces north of Taqah (fig. 340), and at Hagif deep in the interior, were found sites of circular houses in megalithic style that could also be dated to the Bronze Age, based on their flint tools and a few copper fragments. Here also pottery was absent.

These settlements and buildings (fig. 338, 339) are rather different from what is known in northern Oman, but they were probably the dwellings of the



Figure 337:
A site with Bronze and Iron Age structures near Taqah (photo Transarabian expedition / Juris Zarins).

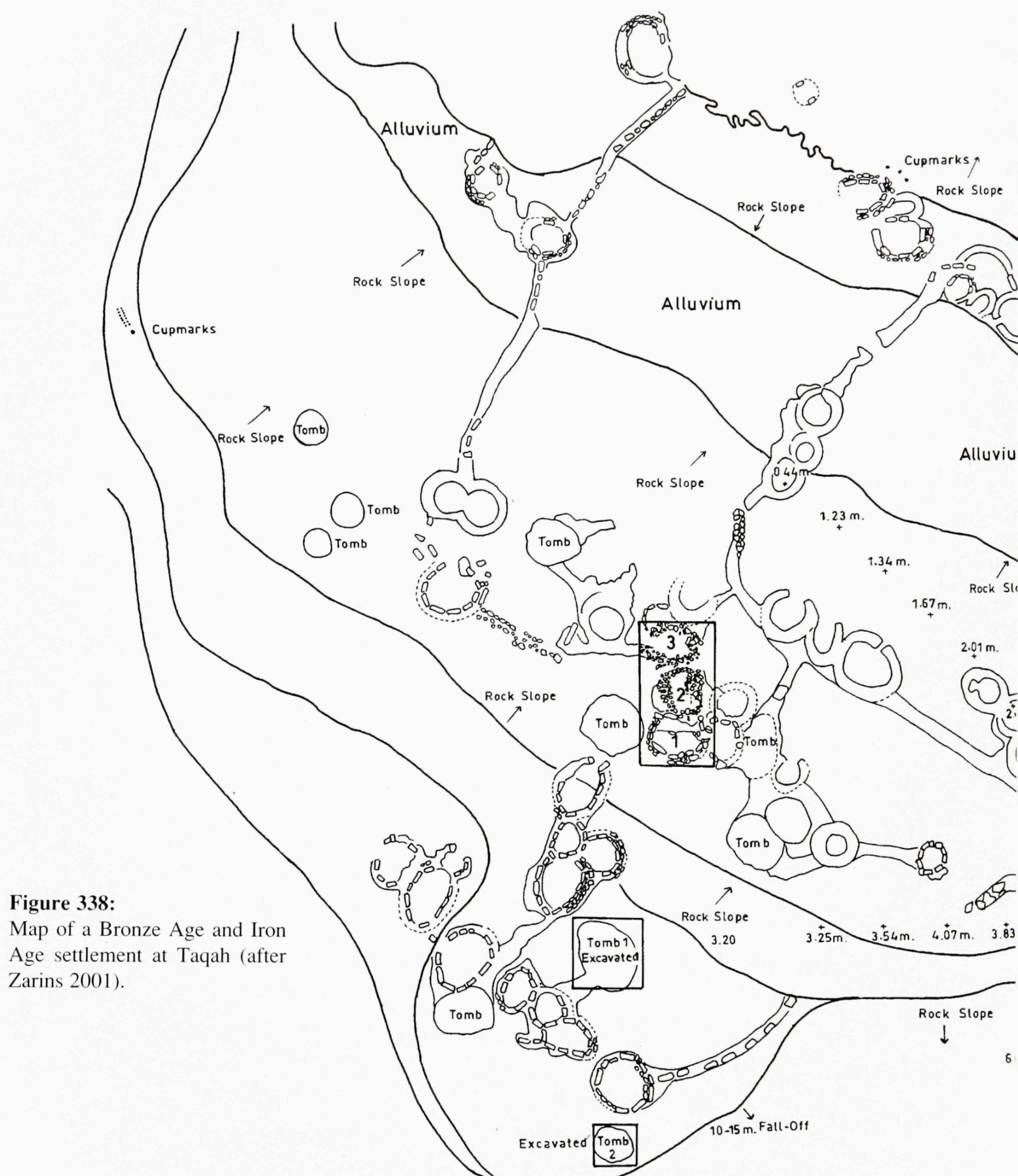


Figure 338:
Map of a Bronze Age and Iron Age settlement at Taqah (after Zarins 2001).

people who also exploited and traded frankincense abroad through the navigation circuits eastwards towards Mesopotamia and India. Whether frankincense was also already exported westwards to Yemen and Egypt, by land or by water through the Red Sea trade networks, remains an open and much debated question. Moreover, the possibility of an inland trade route across the Rub' Al-Khali, through Shisur reaching northwards Jabrin and Al-Hasa in Saudi Arabia, cannot be completely ruled out. Bronze Age remains dating back to 3000 BC, or even slightly earlier, have been found in Jabrin and Al-Hasa, where Mesopotamian imported pottery was also recovered and where the sands were probably less important than now. Donkeys would have been the beasts of burden for caravans of early transarabian trade, if they ever existed. We know from various historical sources that the frankincense trade was very active during the second millennium BC, and this knowledge supplements our scanty archaeological data.

Dhofar at the Height of the Frankincense Trade

From the middle of the first millennium BC the frankincense trade becomes much better known. This stems from various historical sources such as Herodotus, Pliny, the anonymous author of the *Periplus of the Erythrean Sea*, Ptolemy, Strabo, Theophrastus, Diodorus Siculus, and others. From them we learn that frankincense produced in the interior was collected at two main harbours on the coast - *Moscha*, commonly identified as present-day Khor Rori, and *Syagrus*, modern Ra's Fartak. From there it was shipped eastwards, to India and the Gulf, or westwards to Qana along the Yemen coast. From Qana the precious merchandise was shipped to the Red Sea or sent overland towards Shabwa, capital of the Hadramawt, and there it entered the caravan trade that took it eventually to the Mediterranean Sea at Gaza or to the upper Gulf region along Wadi Sirhan. Other land routes led from Dhofar to the South Arabian cities of the Hadramawt before joining the same caravan highway.

The site of Khor Rori was first investigated in the early fifties and remains probably the first archaeological excavation undertaken in Oman. It is a rectangular fort strengthened by towers and stone-built on a low hill overlooking to the east the lagoon of Khor Rori. It was founded with the name *Sumhuram* by a Hadrami king of Shabwa at a date still undetermined. Some historians would suggest the second



Figure 339: A possible protohistoric site in a wadi reaching the sea east of Mughsayl (photo Serge Cleuziou).



Figure 340 – The southern part of the site at Sumhuram and the embayment of Khor Rori. Protohistoric structures have been found on the flat promontories on both sides of the entrance to the khor (photo Serge Cleuziou).

part of the first century AD, as *Sumhuram* is not mentioned in the early first century AD *Periplus of the Erythrean Sea*, a handbook written in Roman Egypt for merchants venturing into these parts. But it is equally possible that it is named there as *Moscha limen*. More recent archaeological excavations point to a foundation towards the end of the first century BC. Recovered there were various classes of pottery of Indian origin, also found westwards at places like Qana or Socotra Island, as well as Roman amphorae produced in Italy and other western Mediterranean countries. The site minted its own coins from the first to the fourth century AD, probably in order to facilitate trade with the Indian world. It lasted until the fourth century AD and was clearly an attempt to secure frankincense trade for the benefit of the Hadrami kings who gained enormous revenues from it. It was also meant to control part of the trade with India, as, according to the texts, Indian merchants were authorised to land only at *Sumhuram*. An Indian bronze figurine of the tree goddess Yakshi, dating from the third century AD, and a Kushan coin of King Kanishka I (first century AD), may bear witness to these foreign merchants. Recent archaeological research in Dhofar by the Transarabian Expedition has, however, demonstrated that the site did not stand isolated in this web of interchanges that reached different ports on the eastern coast of India.

Iron Age sites in Dhofar mostly appear as a continuation of Bronze Age forerunners. These are often rather large sites and difficult to identify because resettled in later periods. One, for instance,

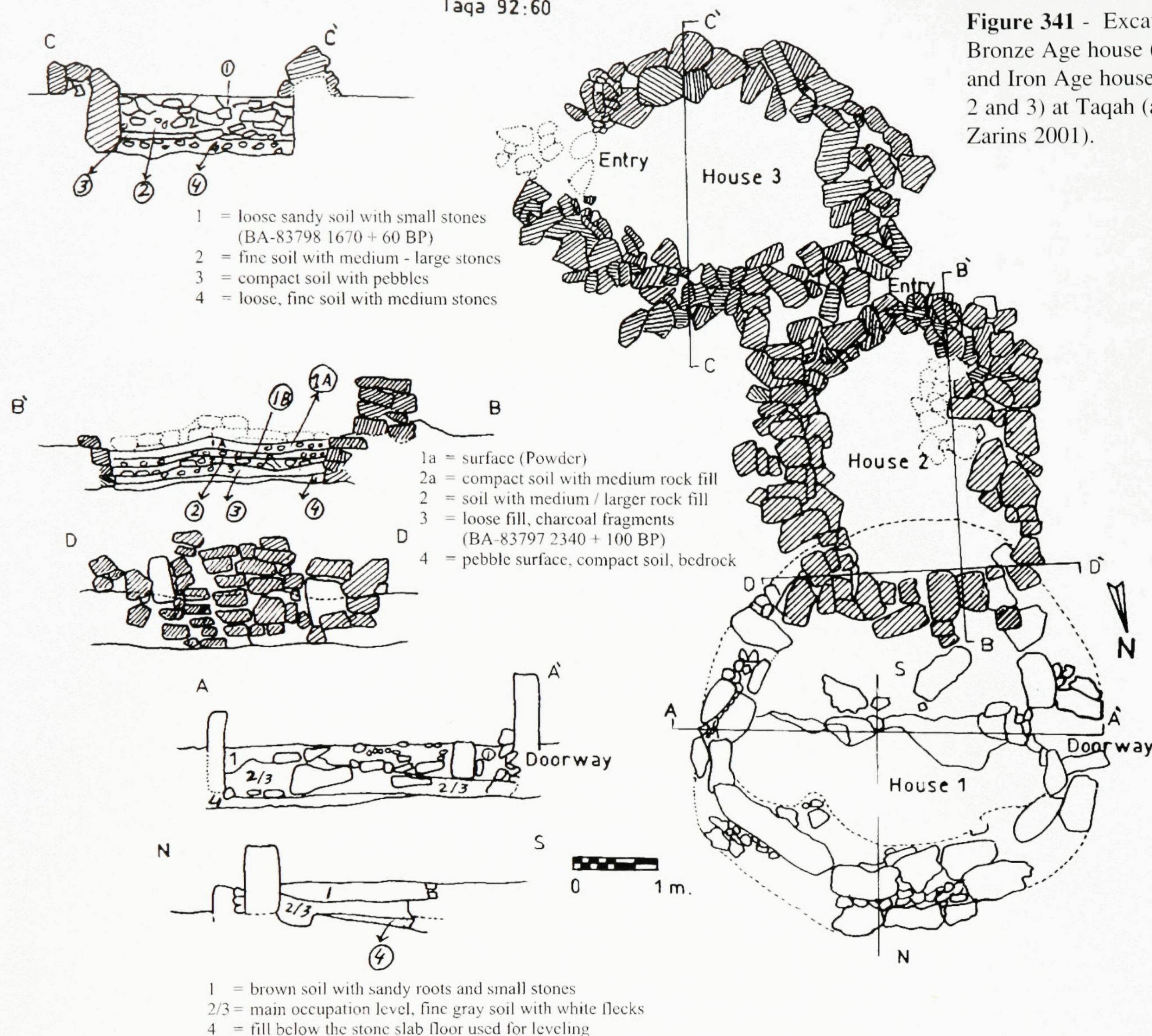


Figure 341 - Excavated Bronze Age house (house 1) and Iron Age houses (houses 2 and 3) at Taqah (after Zarins 2001).

was found at Khor Rori, close to the walls of ancient *Sumurham* (fig. 342). Because no properly built structure was found amidst these shell middens, one can suppose that people had lived in flimsy shelters. More typical Iron Age stone structures are, however, known all along the coast and on the terraces behind it. For example, a series of homesteads was found on high terraces directly overlooking the Indian Ocean from the Raysut area to Mirbat, mainly consisting of large circular houses, corrals, field walls, and ancillary buildings. Some of these villages were erected over Bronze Age ones, often re-using the earlier structures (fig. 341). The foothills and valleys were also marked by many small or larger settlements that appeared to have been primarily engaged in farming. The many caves and shelters in these areas were used as well. Other sites are known deep in the interior, the largest at Hagif, where Iron Age dwellers had reoccupied earlier Bronze Age structures. Northwards, round houses and associated structures have been found on high terraces immediately overlooking the Nejd, notably in the area west of Jibjab.

Several types of burial have been found associated with these settlements. Most spectacular are the boat-shaped graves constructed of large, often megalithic-size stones (fig. 343). The interior of the grave is paved with pebbles or flat slabs and a single individual is buried extended in a simple pit cut into the central portion of the grave. Found in their hundreds, or in smaller numbers, these graves are often joined together creating the impression of rows or clusters. Major cemeteries are found at Ain Humran,



Figure 342:
Iron Age structures around the settlement of Khor Rori. Their relation to the fort and its inhabitants is unclear, although one may imagine local people living near the harbour and trading with it (photo Serge Cleuziou).

Khor Sowli, Khor Rori, Wadi Darbat, and Ain Razat. No offerings were found in the grave chambers themselves, but they may have been deposited in other parts of the monument. In a few cases, Iron Age vessels were found in a grave's upper filling, as at Ain Humran, or scattered around, as at Khor Sowli. Cairns and tumuli continued to be used, as in the Bronze Age.

Although this period is called the Iron Age by assimilation with other areas of the Arabian peninsula, scarcely any iron objects were found. The Dhofar inhabitants continued to rely on flint for their tools, and more particularly on very small flakes, scrapers, and bladelets - what archaeologists call microliths. This tradition is unknown in northern Oman but well documented in Yemen, and in particular in the Hadramawt. Pottery, on the other hand, differs from that found in both northern Oman and Yemen. The paste is rather coarse, tempered with grit or crushed shells. Open bowls and jars are often plain and highly burnished, a small number being decorated with incisions, mainly chevrons and pendant triangles. By the last centuries of the first millennium BC, short inscriptions in a particular type of alphabet called Thamudic script appear all over the country.

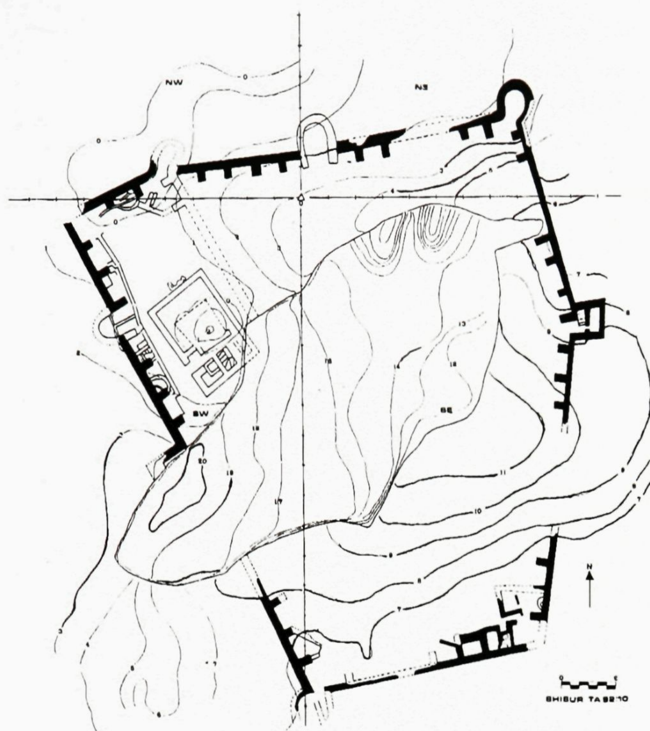
Among the largest and best known sites is Shisur, sometimes identified as the *Ubar* described by such eminent Islamic scholars as Al-Himyari, Al-Idrissi, Al-Thalabi, and Yakut, and where one can also perhaps see the rich capital of the *Iobaritae* people mentioned by Pliny. It is located on a large collapsed limestone dome in the Wadi Ghadun valley in the Nejd. There, some twenty metres below the ruins, is a permanent spring, in use certainly since Neolithic times. This is the last water available before one crosses the Empty Quarter. A fort had been built around this large hole by the third century BC (fig. 344). Its walls are everywhere ninety centimetres thick and made of partly dressed local limestone assembled in dry stone fashion and preserved in places up to a height of two metres. It was strengthened by round or oval towers, while the interior was buttressed at regular intervals by short perpendicular walls forming a circular room-like partition. The site was constantly reoccupied until medieval times, with many alterations made of mud-brick or stones. Even at the beginning of the present century local Bedouins used to clean the space between two walls of this room-like partition and cover it with cloth in order to make shelters. Part of the inner space was destroyed when the surface of the dome fell into a roughly twenty metres deep chasm created by underground water erosion. Pottery includes typical

ware of Dhofari origin, although probably none of it was produced at Shisur itself. Most characteristic is a rather coarse reddish ware, often highly polished outside and decorated with rows of dot circles and roulette impressions. Red polished ware of foreign origin, probably Parthian and coming from Iran, is present by the beginning of the first millennium AD. Fragments of stone vessels, including cubic incense stands of soft stone, were also found at the site.

A similar and better preserved settlement was excavated by the Transarabian Expedition at Ain Humran, on a small hill in the northern part of the Salalah plain (fig. 345). This archaeological site, agricultural in purpose, includes a fortress on the hill-top, similar in plan and construction to that of Shisur, a lower village, fields with possible irrigation devices that used the water of a permanent spring issuing from the mountain nearby, and a cemetery of boat-shaped graves. The fortress was divided into two parts, and inside the upper part, as at Shisur, was a central rectangular building partitioned into three main spaces. Excavations indicate that this building was built prior to 325 BC and continued in use with many alterations until Islamic times. At some time during the Parthian period it made use of baked bricks, an extremely rare construction material around the coast of the Indian Ocean and until now only found at Sohar and Qana. During most of the occupation, the pottery and other items found resemble those found at Shisur and many other places, like Mughsayl, Raysut, Old Taqa, Khor Sowli, Khor Jnawf, Hasek, Sowda in the Hallaniyat Islands, and Andhur in the Nejd. Similar ceramics have also been found at Al-Balid, suggesting an occupation anterior to the well-known Islamic harbour town. What is, however, interesting is that these ceramics, common all over Dhofar, are almost absent from the fortified settlement founded by a king of Hadramawt at *Sumhuram* in order to tap the frankincense supply.



Figure 343 – A boat grave east of Mirbat. Such graves may date from the Iron Age (photo Serge Cleuziou).



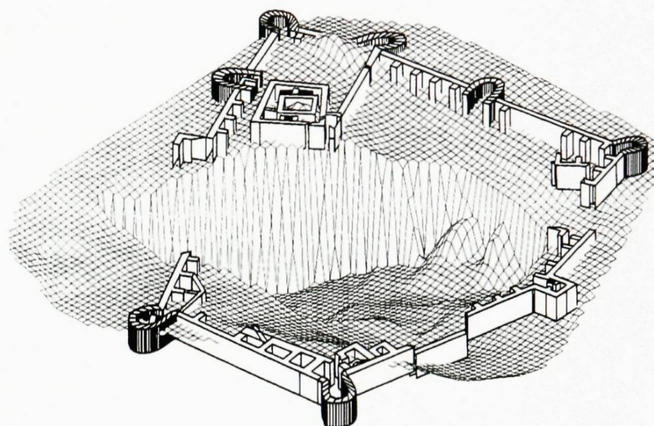


Figure 344 – Plan and isometric views of the settlement at Shisr (Ubar) according to the 1992 excavations (after Zarins 2001).

One explanation may be that this control was far from complete and that primary extraction of frankincense as well as sections of the trade remained in local hands. Ubar has been the subject of many romanticised stories in the recent past. Such legends apart, no matter how attractive they might be, Ubar can most likely be considered as a last stop on a possible trade route crossing the Empty Quarter directly north towards Eastern Arabia and the Gulf, where it perhaps reached mercantile cities like *Gerrha*, known from historical sources to have been founded in the seventh century BC by Chaldean exiles from Mesopotamia. Its remains have never been properly located, but we know, however, of many contemporaneous sites, like Thaj and Ain Jawan in Saudi Arabia, or the city of Qala'at Al-Bahrain, that were continuously settled from the 8th century BC to the Christian Era. The existence of such a route, together with others through Hasek, the Hallanyiat Islands, Masirah, and further east, may be evidence that the local inhabitants still kept control of part of the production. At the time of Ibn Battutah, Hasek was a very active trading port and frankincense from this area is nowadays still reputed to be among the best in Oman.

A particular type of monument, found scattered between the Hadramawt and the mountain pied-

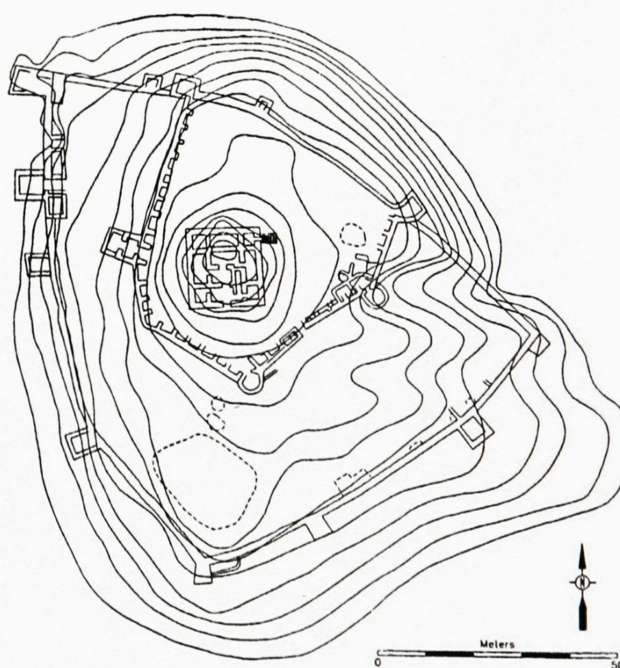


Figure 345 – Plan of the possibly Iron Age settlement at Aïn Humran (after Zarins 2001).



Figure 346 – Nejd: a typical group of triliths. Note the large hearths aligned parallel to the platform supporting the raised stones (photo Serge Cleuziou).



Figure 347 – Nejd: several lines of triliths along the frankincense trail (photo Serge Cleuziou).



Figure 348 – Nejd: an isolated line of triliths along the track beside the road from Thumrait to Marmul (photo Serge Cleuziou).

monts of northern Oman, may be related to the culture of a community of people who moved across the Eastern Arabian corridor at the same time. These monuments have been called "triliths" by the archaeologists. They appear as alignments of three standing stones on long bench-like platforms that vary in length from a few to some forty metres. Beside them is a parallel row of fireplaces delineated by a circle of stones and filled with ashes and burnt stones fig. 346). Their function appears to have been ritual, including food consumption, rather than funerary or simply domestic. In Dhofar, the main concentrations are seen in the northern Qara Mountains looking towards the Nejd (fig. 347) and east of Mirbat, while others have been found near Shuwaymiah. In northern Oman, large fields of triliths are known at Al-Jawabi east of Ja'alan Bani bu Ali or at Qabil yal Busaid in Wadi Ghurayb, northwest of Al-Mudaybi; and many small isolated ones have been found when prospecting in the Ja'alan (fig. 349). These monuments have never been properly excavated, but one carbon 14 analysis of fireplace material indicates a date between 200 BC and 200 AD. Several authors have suggested linking them with South Arabic-speaking people, like those of Dhofar around that same period, especially in view of a fourth stone bearing South Semitic script sometimes found placed on top of the three standing ones. Whoever built and used them, the triliths may be associated with people who travelled across the desert areas between Yemen and northern Oman, and this constant movement of people is certainly reflected both in trade and in the local memories of historical events. ❑



Figure 349 – Ja'alan, northern Oman: a line of triliths. Some 12 similar sites were found during the surveys of the Joint Hadd project, in addition to a large field at Al-Jawabi near Ja'alan Bani bu Ali (photo Joint Hadd Project).

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(a selected bibliography)

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